PORTABLE STEREO CASSETTE RECORDER

MODEL CD-320

SERVICE DATA

DEC./1978

SUPERSCOPE
PROFESSIONAL CASSETTE RECORDER / CD-320
ONE TOUCH RECORD / SERVO CONTROL / DUAL FLYWHEEL
REC
REW/REVIEW
PLAY
FF CUE
STOP/EJECT
PAUSE
PHONES
MIC ATT
0dB
20dB
MIC
L
R
REC SELECT
ANL
MANUAL
LIMITER
BATTERY CHECK
DOLBY NR
OFF
ON
TAPE SELECT
EQ 120µS BIAS LOW
70µS
HIGH
TONE
VOL
REC LEVEL
LEFT
RIGHT
VU

SUPERSCOPE®
BY marantz®

SUPERSCOPE INC.
20525 NORDHOFF STREET CHATSWORTH,
CALIFORNIA 91311·U.S.A

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SPECIFICATIONS

GENERAL

Dimensions (W x H x D)	29.3 x 8.2 x 19.5 cm (11⅝ x 3¼ x 7¾ inches)
Weight	3.6 kg (7 lb 15 oz) with batteries 3.2 kg (6 lb 10 oz) without batteries
Power Requirements	
DC:	Four UM-1, "D" size flashlight batteries (Rechargeable pack: Model RBD-1)
AC: For Europe	220/110 V, 50 Hz, 13W
For USA & Canada	120 V, 60 Hz, 13 W
Number of Semiconductors	
Transistor	20
Diode	24
IC	5
Terminals	
Input: Microphone	2 (one for each channel)
Plug Type	¼"
Input Sensitivity	−72 dBV
Impedance	10 kΩ
Line (Aux)	2 (one for each channel)
Plug Type	RCA Pin
Input Sensitivity	−30 dBV
Impedance	50 kΩ
Output: Line	2 (one for each channel)
Plug Type	RCA Pin
Output Level	800 mV
Impedance	1.5 kΩ
DIN (Rec./Play)	1
Plug Type	DIN
Input Sensitivity	20 mV
Input Impedance	30 kΩ
Output Level	800 mV at ±1.9 VU
Output Impedance	1.5 kΩ
EXT. Speaker	2 (one for each channel)
Plug Type	Mini
Power Output	1200 mW x 2
Stereo Headphone	1
Plug Type	Phone
Impedance	8 Ω
AC Inlet	1
DC Jack	1

TAPE RECORDING SECTION

Tape	PHILIPS Type Compact Cassette Tape
Recording System	Quarter track stereo, AC Bias
Erasing System	Half track, AC Erase
Rewind & Fast Forward Time	110 sec/C-60
Number & Type of Motor	One DC servo

1. FEATURES

1.1 Fully Selectable Automatic Record Level and Peak Limiter

According to program source, three selections are possible – ARL, LIMITER and MANUAL.

1.2 One-Touch Recording

The tape recorder can be set to the recording mode just by pressing the REC button. There is no need to press the PLAY button.

1.3 Automatic Total Mechanism Shut Off

When the tape comes to the end in any of the playback, record, fast foward and rewind modes of operation, the tape tension-controlled auto-stopper actuates to automatically release the locked pushbutton. It takes 2 to 6 seconds to release the pushbutton after the tape is wound up; note that the interval becomes longer with decrease of the power line voltage. Locked PAUSE pushbutton prevents operation of the auto-stopper.

1.4 Dual Flywheel Mechanism

Applying two flywheels turning round oppositely to each other, the strength caused by wobble or others is canceled each other, and stable performance of flywheel rotation is always assured.

1.5 Cue and Review Pushbuttons

By depressing the CUE or REVIEW pushbutton, the tape can be fast forward or rewind while monitoring recorded sound. This feature is very convenient for easy reference and indexing or repeated playback. By depressing the CUE or REVIEW pushbutton with the PLAY pushbutton leaving depressed, the pinch roller is separated from the capstan, allowing the tape to be run at a high speed.

1.6 Four-Way Power Supply

The Model CD-320 can be operated by four power sources: dry cells (UM-1 x 4), AC power line, external DC power supply (DCA-6, sold separately) and rechargeable battery back (RBD-1, sold separately). To prevent the possibility of being overloaded by two or more power sources, the contacts of the AC jack (J001) and external DC jack (J002) automatically select only one power supply in the following priority: 1. AC power line; 2. external DC power supply; 3. dry batteries (rechargeable battery pack). Thanks to its built-in recharge circuit, even when not operated, the Model CD-320 can recharge the rechargeable battery pack as long as it is connected to AC power line or external DC power supply.

2. SERVICE NOTE

As can be seen from the circuit diagram, the chassis of Model CD-320 consists of following units. Each unit mounted on a printed circuit board is described with the square enclosed by bold dotted line on the circuit diagram.

Pre-Amp, Power Supply, Switch, Input Select, Dolby	**mounted on P.W. Board P100**
Terminals	**mounted on P.W. Board P500**
Power Select (N Version)	**mounted on P.W. Board P400**
Mic. Att.	**mounted on P.W. Board P700**
Headphone	**mounted on P.W. Board P600**
Rechargeable	**mounted on P.W. Board P801**
Fuse (UC Version)	**mounted on P.W. Board P900**

3. TEST EQUIPMENT REQUIRED FOR SERVICING REPLACEMENT

For measuring checking the Model CD-320, the following instruments and materials are necessary.

- Audio Oscillator (af OSC)
- Attenuator (600 Ω)
- VTVM
- Distortion Meter
- Oscilloscope
- Bandpass Filter
- Wow and Flutter Meter
- Torque Meter (Cassette Type)
- Digital Frequency Counter
- Blank Tape (Completely erased with bulk eraser)

TDK AC-211	(Normal)
TDK AC-511	(CrO_2)
SONY CS-30	(Fe-Cr)

NOTE: If any doubt is noted in a measured value, used new tape.

- Test Tapes (New Tape)

MTT-111	Wow and Flutter, Tape Speed
MTT-112	Measurement of Output Level, Signal-to-Noise Ratio
MTT-150	Adjustment of Output Level
MTT-116U	Frequency Response (for Normal)
MTT-116K	Frequency Response (for CrO_2, Fe-Cr)
MTT-121	Cross Talk
MTT-141	Channel Separation
MTT-115C	Playback EQ, Azimuth

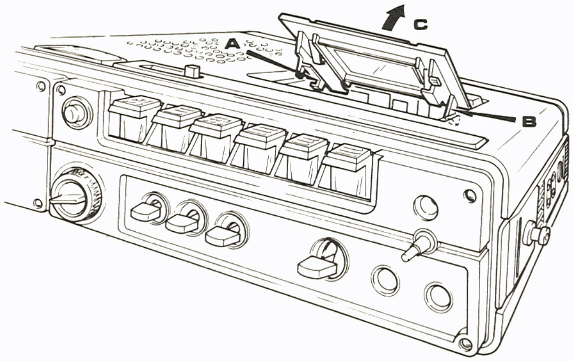
BIAS and EQ switches setting in accordance with tape used are as follows:

	Bias	EQ
Normal	Low	120μs
CrO_2	High	70μs
Fe-Cr	Low	70μs

4. BOTTOM CASE COVER AND CHASSIS DISASSEMBLING PROCEDURES

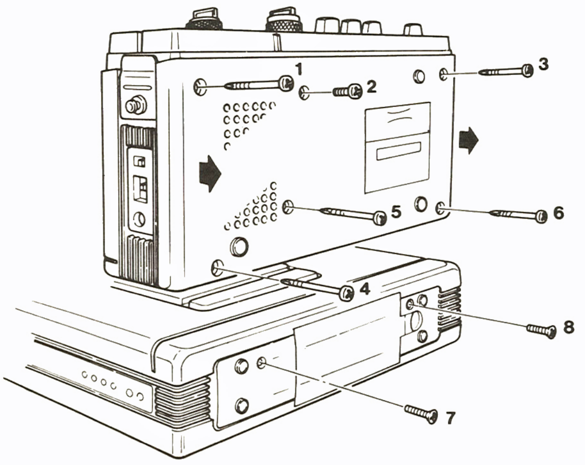
4-1 Removing Cassette Cover

Pull the cover pushing **A** and **B** in the direction of an arrow. Then the cover will be removed.



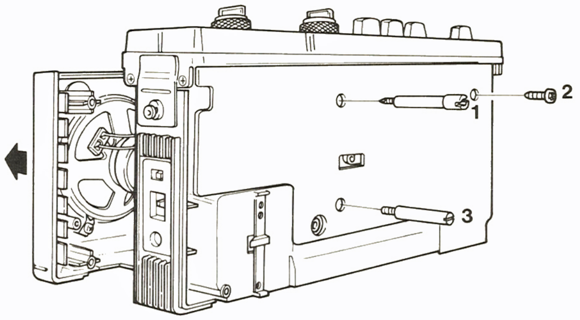
4-2 Removing Rear Cover

Remove six screws **1** to **6** at the rear. Remove screws **7** and **8** at the bottom. Pull the rear cover in the direction of an arrow, and it will be removed.



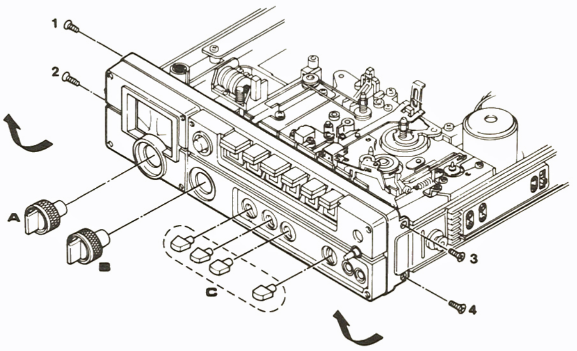
4-3 Removing Top Case

Remove three screws **1** to **3**. Pull the top case in the direction of an arrow, and it will be removed. At that time, remove the connection wire (soldered) of the speaker.



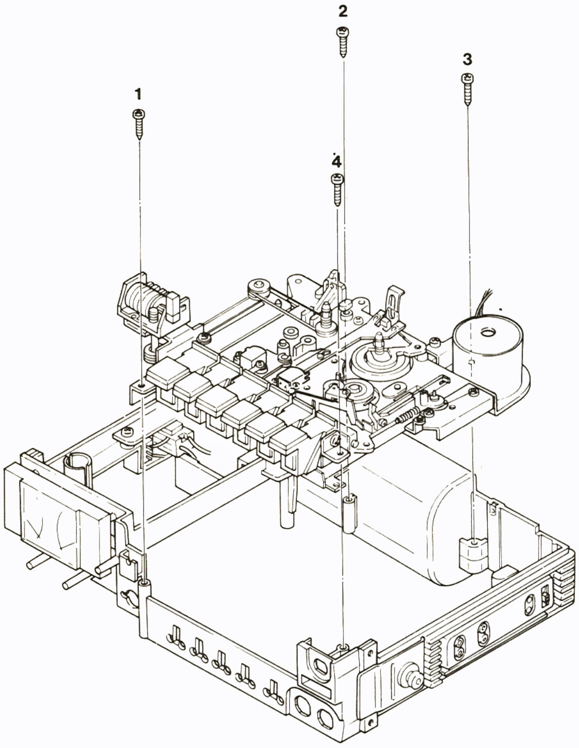
4-4 Removing Front Case

Remove the dials **A** and **B** and remove four knobs. Remove four screws **1** to **4** from the sides. Remove the front case in the direction of an arrow. At that time, it is recommended to lower the control buttons before the front case is removed since it is difficult to remove it due to catching of it by the control buttons.



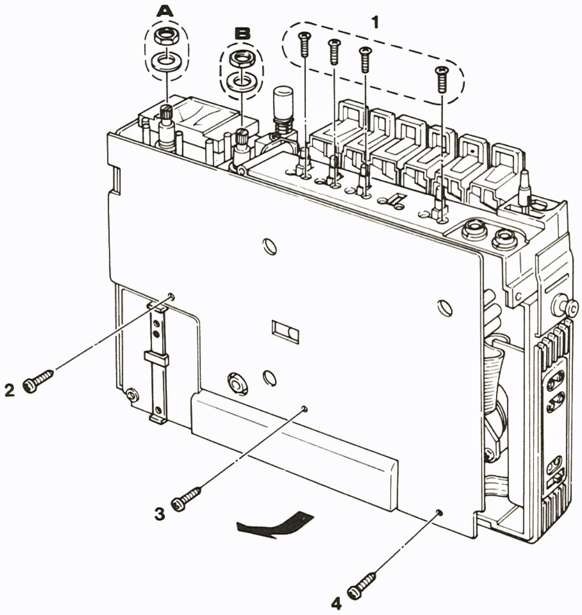
4-5 Removing PW Board

Remove four screws **1** and then remove nuts **A** and **B**. Remove screws **2** to **4** from the PW board. Remove the PW board in the direction of an arrow.



4-6 Removing Mechanism

Remove four screws **1** to **4**, and the mechanism will be removed.



5. ADJUSTMENT AND MEASUREMENT (AUDIO) INSTRUCTIONS

Precautions: Prior to any adjustment or measurement, clean the head slits with gauze containing alcohol or carbon tetrachloride, and fully demagnetize the heads, capstan and similar parts.

5-A MECHANICAL ADJUSTMENTS

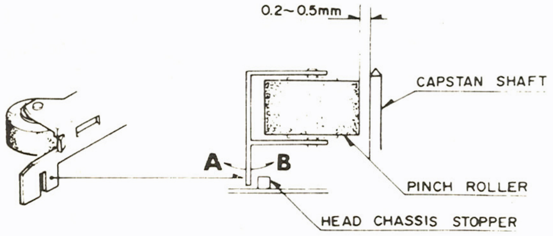
5A-1 Play Operation Check

(1) Timing Check

- Depress button PLAY, and check to make sure that the take-up reel rotates first and then that the pinch roller rotates. Simultaneous rotation of these reel and roller is not acceptable.

  NOTE: For this check, slowly depress the button without tape mounted regardless of locking condition.

- Slowly depress button PLAY, and the take-up reel will start rotation. At that time, check to make sure that a clearance between the pinch roller and capstan is less than 0.5 mm.



(2) Timing Adjustment

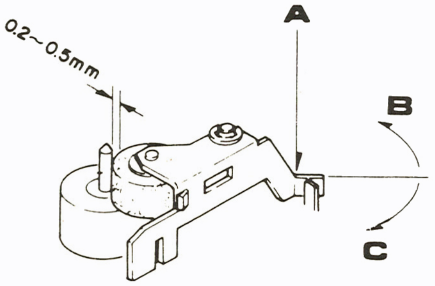
If out of specification, bend the part of the pinch roller bracket which faces the head chassis stopper. In the figure shown above, bend the part in the direction of **A** to decrease the clearance. To increase the clearance, bend the part in the direction of **B**.

NOTE: After adjustment, check to be sure that the pinch roller bracket does not contact the head chassis stopper in PLAY mode.

5A-2 Pause Timing

Depress button PLAY, slowly depress button PAUSE, and the take-up reel will pause. At that time, check to ensure that a clearance between the pinch roller and capstan ranges from 0.2 to 0.5 mm. If out of the range, adjust a bending angle of the pinch roller bracket arm (view **A**).

NOTE: To increase a clearance between the pinch roller and capstan, decrease the angle (in the direction of **C** in the figure). To decrease the cleanrace, increase the angle (in the direction of **B**).

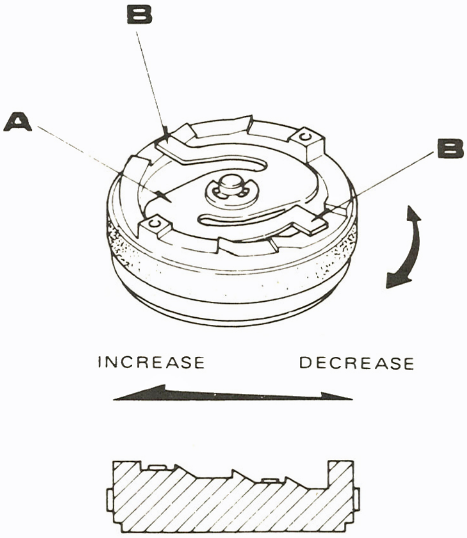


5A-3 Torque Adjustment (FF, REW)

Set the extended parts (**B** in the figure shown above) of the torque adjustment leaf spring (**A** in the figure) of the FF/REW idler on any one of three stepping parts of the idler.

NOTE: To increase torque, set the extended parts to the stepping part of "INCREASE" and to decrease it, set those to the stepping part of "DECREASE".

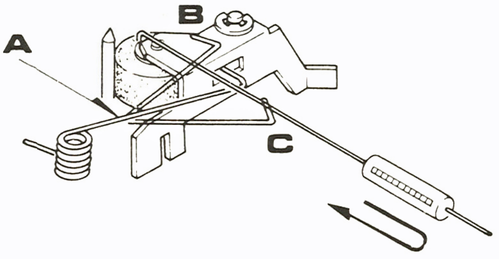
Adjusting range: 70 ~ 110 g.cm.



5A-4 Pinch Roller Pressing Force

As shown above, measure pressing force of the pinch roller using a gauge. For measurement, proceed as follows. Pull the pinch roller off the capstan shaft as shown with the arrow, and gradually release it to the capstan. Just when the pinch roller starts rotating, read an indication of a gauge. Pressing force must range in 300 g ±50 g. If our of the range, bend the pinch roller spring in the direction of **B** or **C** at section **A** shown above.

NOTE: To increase pressing force, bend the said spring in the direction of **B**, and to decrease the force, bend it in the direction of **C**.



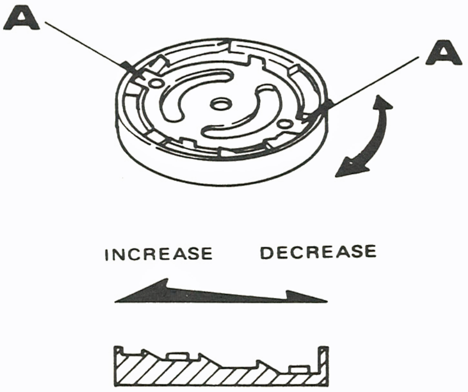
5A-5 Torque Adjustment (PLAY)

Mount the extended parts **A** (two) of the disc leaf spring on any one of the stepping parts of the idler. Adjusting range: 40 to 70 g.cm.

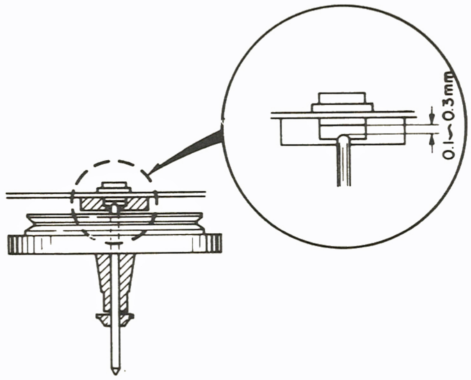
NOTE:

(1) To increase torque, mount the extended parts on "INCREASE" and to decrease torque, mount them on "DECREASE".

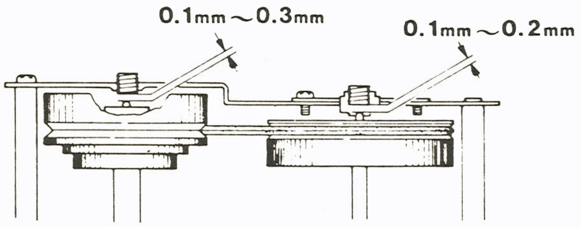
(2) Check the take-up clutch for slipping. When the reel base is paused, the wheel must smoothly rotate. The wheel, when irregularly rotating or stopping, is not acceptable.



5A-6 Flywheel Thrust Adjustment

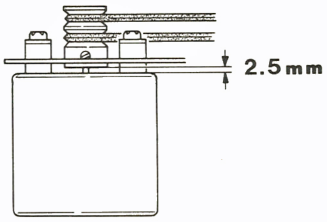


Adjust a clearance between the capstan tail end and thrust bearing to a range from 0.1 to 0.3 mm as shown. Adjust the thrust screw in the flywheel bracket using a Philips screwdriver. Since the clearance cannot be directly measured, capture a distance in an axial step of the flywheel with the sensibility. After adjustment has completed, secure the thrust screw with the screw lock.



5A-7 Installation of Motor Pulley

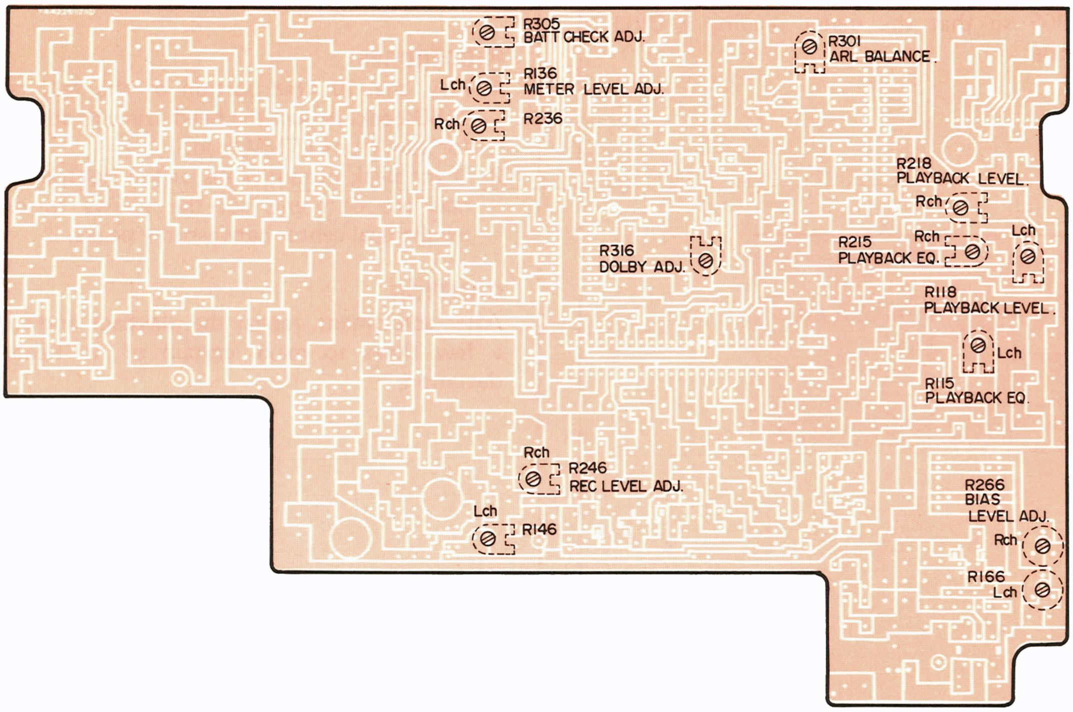
Check to ensure that a clearance between the DC motor and pulley is 3.1 mm. If out of specification, reposition the pulley as shown.



5A-8 Tape Speed Adjustment

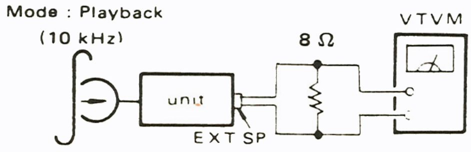
Mount 3 kHz test tape on the set, and check to make sure that the meter pointer of a measuring instrument (frequency counter) indicates 3000 Hz ±3% or less as specified. If tape speed exceeds the high limit, replace the pulley with a pulley of parts No. 4367262050. If the speed is lower than the low limit, replace it with a pulley of parts No. 4367262040.

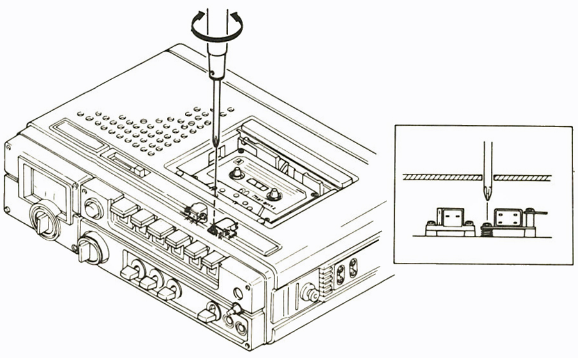
5-B ELECTRICAL ADJUSTMENT


R305
BATT CHECK ADJ.
R301
ARL BALANCE
Lch
R136
METER LEVEL ADJ.
Rch
R236
R218
PLAYBACK LEVEL
Rch
R316
DOLBY ADJ.
R215
PLAYBACK EQ.
Rch
Lch
R118
PLAYBACK LEVEL
Lch
R115
PLAYBACK EQ.
Rch
R246
REC LEVEL ADJ.
Lch
R146
R266
BIAS
LEVEL ADJ.
Rch
R166
Lch

5B-1 Azimuth Adjustment

Play back the 10 kHz or 6.3 kHz standard alignment tape. Adjust the azimuth adjusting screw 836 N. After adjustment, repeatedly start and stop the tape several times to ensure no azimuth deviation.


Mode : Playback
(10 kHz)
8 Ω
VTVM
unit
EXT SP



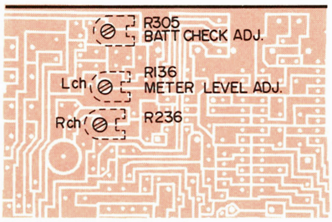
5B-2 Meter Adjustment

SET UP

1. Power voltage: DC 4.5 V
2. Batt. check switch position: ON

PROCEDURES

1. Set up the unit for the playback mode of operation.
2. Apply an external DC 4.5 V source to the DC 6 V jack.
   Adjust R305 so that the meter reading is 0VU point of scale.



5B-3 Head Azimuth Adjustment

SET UP

1. Power voltage:
   - 50/60 Hz voltage rated for the unit to be used in a market country.
   - DC 6 V
2. Output terminal: LINE Output
3. EQ switch position: 120 μS
4. Test tape used: MTT-115C

PROCEDURES

1. Play the 10 kHz portion of the test tape MTT-115C back. Adjust the head azimuth adjusting screw for maximum VTVM read.
2. If the peak output reads of the right and left channels are different, set the screws to obtain the mechanical center between the peaks.

CAUTION

After adjustment, repeat the playback and stop setting a few times to make certain of no head azimuth deviation.

5B-4 Tape Speed Adjustment

SET UP

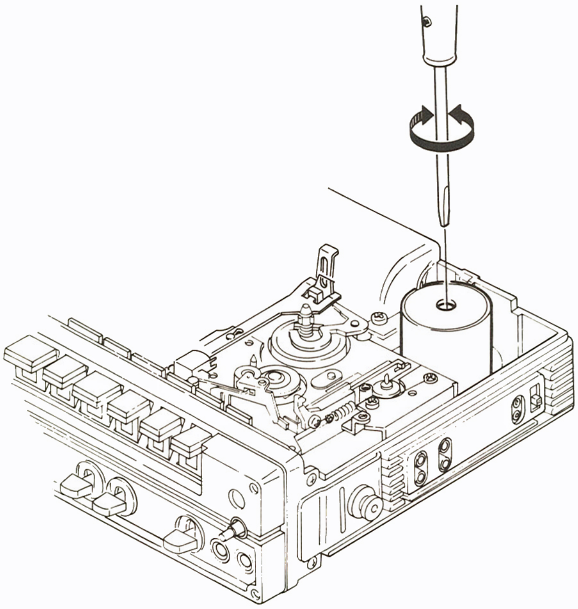
1. Power voltage:
   - 50/60 Hz AC voltage rated for the unit to be used in a market country.
   - DC 6 V
2. Output terminal: LINE Output
3. Test tape used: MTT-111 (3 kHz tone)
4. Unit position: Horizontal

PROCEDURE

Play the mid position of the test tape MTT-111 back. Adjust the tape speed adjusting semi-fixed resistor 3000 ±5 Hz counter indication.

CAUTIONS

1. For adjustment the unit should be set up in the normal operating condition.
2. Do not proceed the semi-fixed resistor more turns than needed.
3. Do not proceed with adjustment after the unit.
4. If a strong shock or similar vibration is applied to the unit after adjustment, make certain that the measured tape speed had not changed.
5. If the speed deviation occurs, perform the adjustment again.
6. Be careful that the counter may indicate a wrong value because of too low counter level.
7. Before adjustment, allow for 30 seconds or more after depressing of the PLAY pushbutton.



5B-5 Playback Output Level Adjustment

SET UP

1. Power voltage:
   - 50/60 Hz voltage rated for the unit to be used in a market country.
   - DC 6 V
2. Output terminal: Terminal No. 8, 9 of Dolby IC Q109
3. EQ switch position: 120 μS
4. Test tape used: MTT-150

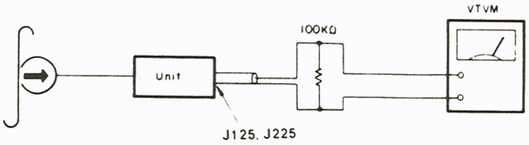
PROCEDURES

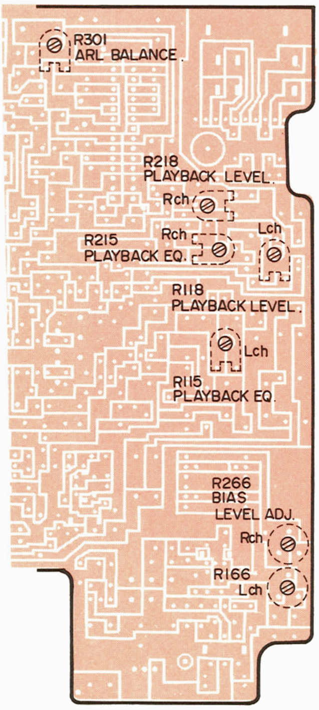
1. Play the test tape MTT-150 playback. Adjust R118 and R218 (20 kΩ each) for 775 mV playback output level.
2. Proceed both for the right and left channels in the same manner.

CAUTION

This adjustment should be performed after the one for the playback equalizer. If the playback equalizer is adjusted after the playback output adjustment, the playback output should be readjusted.

Mode: playback





5B-6 Playback Equalizer Adjustment

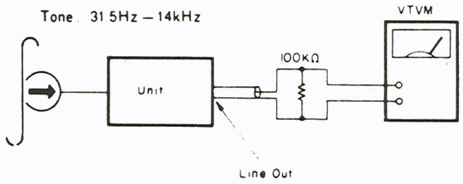
SET UP

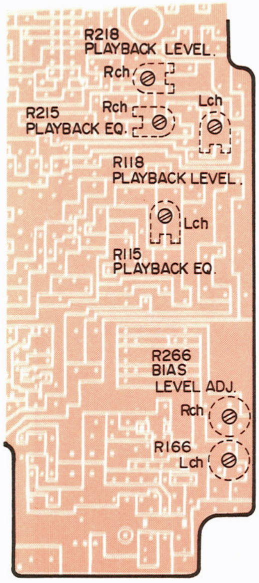
1. Power voltage:
   - 50/60 Hz voltage rated for the unit to be used in a market country.
   - DC 6 V
2. Output terminal: LINE Output
3. EQ switch position: 120 μS
4. Test tape: MTT-115C

PROCEDURES

1. Play the test tape MTT-115C. Let the 333 Hz signal level be reference as 0 dB.
2. Adjust R115 and R215 (3 kΩ each) for 10 kHz frequency response of 0 to 0 dB in reference to the 333 Hz signal level.
3. Proceed both for the right and left channels in the same manner.
4. Note that clockwise turning of R115 and R215 will increase the 10 kHz signal output level.

Mode: playback


Tone 31.5Hz – 14kHz
VTVM
100KΩ
Unit
Line Out


R218
PLAYBACK LEVEL
Rch
R215
PLAYBACK EQ.
Rch
Lch
R118
PLAYBACK LEVEL
Lch
R115
PLAYBACK EQ.
R266
BIAS
LEVEL ADJ.
Rch
R166
Lch

5B-7 VU Meter Adjustment

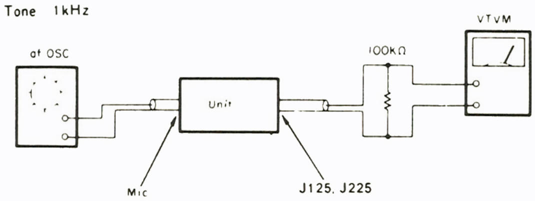
SET UP

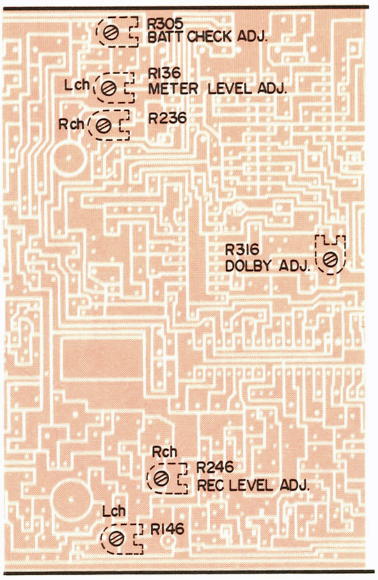
1. Power voltage:
   - 50/60 Hz AC voltage rated for the unit to be used in a market country.
   - DC 6 V
2. TAPE selector switch position: NORMAL
3. Load: Measuring instrument input impedance
4. Output terminal used: Terminal No. 8, 9 of Dolby IC Q109

PROCEDURES

1. Play the test tape MTT-150.
2. Adjust R136 and R236 (2 kΩ each) until the VU meter pointer deflects to the DOLBY mark (DD) on the VU meter.

Mode: record


Tone 1kHz
af OSC
100kΩ
VTVM
Unit
Mic
J125, J225


R305
BATT CHECK ADJ.
Lch
R136
METER LEVEL ADJ.
Rch
R236
R316
DOLBY ADJ.
Rch
R246
REC LEVEL ADJ.
Lch
R146

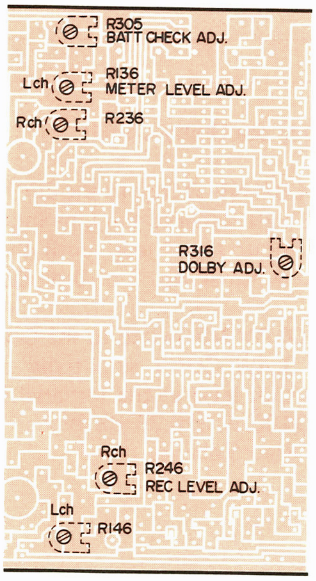
5B-8 Recording Current Adjustment (Temporal)

SET UP

1. Power voltage:
   - 50/60 Hz AC voltage rated for the unit to be used in a market country.
   - DC 6 V
2. Input signal: 1 kHz, −60 dB signal
3. TAPE selector switch positions: NORMAL
4. Load: Measuring instrument input impedance

PROCEDURES

1. Stop the recording bias current oscillation by disconnecting the bias circuit +B resistor (R314).
2. Disconnect the recording head shielding leads (grounding leads) at J302 (L channel) and J302 (R channel). Insert a 10 Ω resistor between the respective leads and terminals. Connect a VTVM across each resistor. Set the CD-320 in the recording mode of operation. Adjust the semi-fixed resistors R146 (L channel) and R246 (R channel) until the VTVM reads 0.45 mV each channel.
3. Proceed both for the right and left channels in the same manner.
4. After adjustment, release the recording bias current.


R305
BATT CHECK ADJ.
Lch
R136
METER LEVEL ADJ.
Rch
R236
R316
DOLBY ADJ.
Rch
R246
REC LEVEL ADJ.
Lch
R146

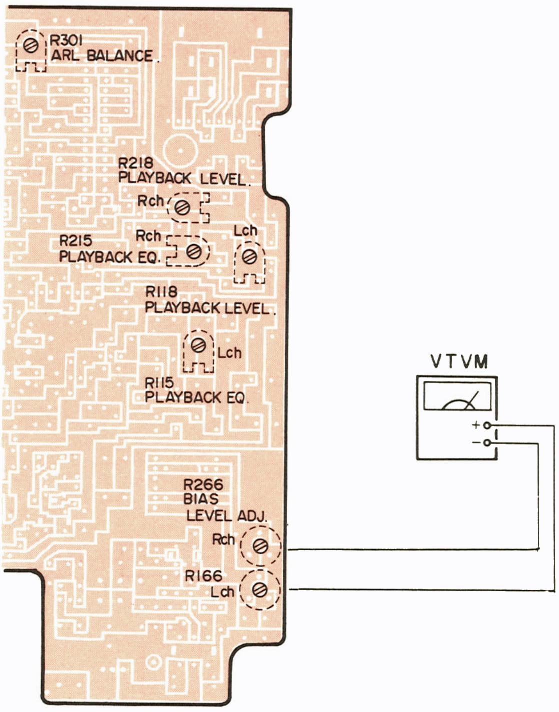
5B-9 Recording Bias Current Adjustment (Temporal)

SET UP

1. Power voltage: Only when the 6 V DC power voltage is primary for the unit and this power voltage is unavailable, use AC power supply.
2. TAPE selector switch: NORMAL

PROCEDURES

1. Disconnect the recording head shielding leads (grounding leads) at J302 (L channel) and J302 (R channel). Insert at 10 Ω resistor between the respective leads and terminals. Connect a VTVM across each resistor. Set the CD-320 in the recording mode of operation. Adjust the semi-fixed resistors R166 (L channel) and R266 (R channel) until the VTVM reads 3.2 mV in each channel.
2. For the CD-320 equipped with the TAPE selector switch, make certain that the VTVM reads approximately 4.2 mV with it set to the CrO_2 position.


R301
ARL BALANCE
R218
PLAYBACK LEVEL
Rch
R215
PLAYBACK EQ.
Rch
Lch
R118
PLAYBACK LEVEL
Lch
R115
PLAYBACK EQ.
R266
BIAS
LEVEL ADJ.
Rch
R166
Lch
VTVM
+
−

5B-10 Record-Playback Frequency Response Adjustment

SET UP

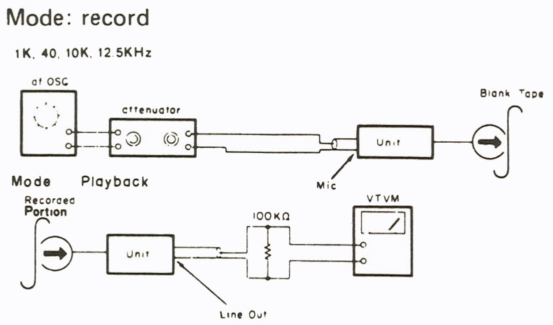
1. Power voltage: Only when the 6 V DC power voltage is primary for the unit and this power voltage is unavailable, use AC power supply.
2. Input signal: 1 kHz, -60 dB with -20 dB referenced as 0 VU
3. TAPE selector switch: Bias: Low
   EQ: 70 μS
4. Output terminal: LINE OUT
5. Load: Measuring instrument input impedance
7. Test tape used: SONY CS-30

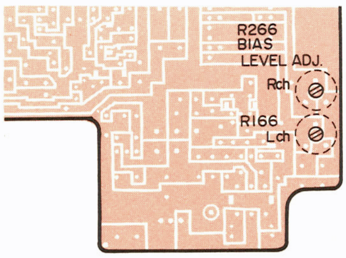
PROCEDURES

1. Connect the input signal to the MIC terminal. Set up the CD-320 to the normal recording state.
2. In turn, reduce the input level by 20 dB with the use of the attenuator. Record the 1 and 10 kHz tones.
3. Play back the 1 kHz, 20 dB-down recorded tone as 0 dB. Adjust the semi-fixed resistors R166 (L channel) and R266 (R channel) until the response at 12.5 kHz is within ±1 dB as referenced to 0 dB (the response at 1 kHz).
4. Proceed both for the right and left channels in the same manner.
5. If the recording bias current is reduced in the above adjustment, be sure to measure the distortion.

CAUTION

The adjusting rod should be non-metalic.





5B-11 Bias Trap Adjustment

SET UP

1. Power voltage:
   - 50/60 Hz AC voltage rated for the unit to be used in a market country.
   - DC 6 V
2. Tape selector switch position: Bias-High

PROCEDURES

1. Set up the unit in the recording mode of operation.
2. Connect the VTVM to LINE Output and collector of Q106. Adjust L101 and L103 for minimum VTVM read.
4. In turn, connect the VTVM to LINE Output (R ch) and collector of Q206. Adjust L201 and 203 for minimum VTVM read.

CAUTIONS

1. If the leak bias is less than the specified value, the bias trap needs not to be adjusted since the adjusting coil is factory preset.
2. The adjusting rod used should be nonmetalic.

5B-12 Adjusting the Dolby Circuit

1. Set the DOLBY NR switch to the OFF position.
2. Connect a 5 kHz signal to the Line input jack.
3. Adjust the input signal level until the output voltage at the terminal No. 9 or 8 of Dolby IC Q109 is 23.5 mV.
4. Turn the DOLBY NR switch to the ON position.
5. Adjust the LAW CONT semi-fixed resistor R316 until the output level at the terminal No. 9 or 8 of Dolby IC Q109 is 8±0.25 dB higher than the one obtained in Step 5 above.

5B-13 Playback Signal to Noise Ratio Measurement

SET UP

1. Power voltage:
    - 50/60 Hz AC voltage rated for the unit to be used in a market country.
    - DC 6 V
2. EQ switch position: 120 μS, 70 μS
3. Output terminal: LINE Output
4. Test tape used: MTT-112

PROCEDURES

1. Load the test tape MTT-112. Set up the unit to the normal playback state with the use of the I.E.C. A-curve Filter.
2. Read playback output as a 0 dB reference. Then playback blank tape and note the output level drop in dB.
3. Proceed both for the right and left channels in the same manner.
4. Repeat the above measurement for each tape selector switch position.

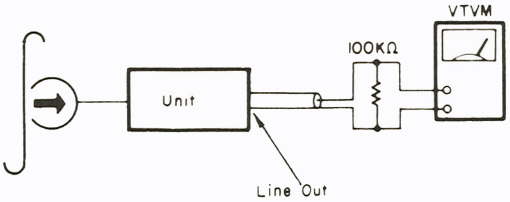
STANDARD

Greater than 54 dB

CAUTIONS

1. Arrange the unit power cord for minimum hum component.
2. Effect by induction noises shouldbe minimized for the measurement.

Mode: playback
Tone 333Hz



5B-14 Playback Output Level Measurement

SET UP

1. Power voltage:
    - 50/60 Hz AC voltage rated for the unit to be used in a market country.
    - DC 6 V
2. EQ switch position: 120 μS
3. Output terminal: LINE Output
4. Test tape used: MTT-112

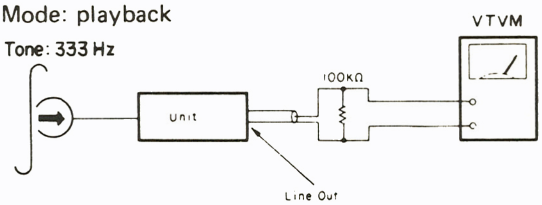
PROCEDURES

1. Play the tape back in the normal playback state. Read the VTVM indication.
2. Proceed both for the right and left channels in the same manner.

STANDARD

Within 860 mV

Mode: playback
Tone: 333 Hz



5B-15 Playback Frequency Response Measurement

SET UP

1. Power voltage:
   - 50/60 Hz AC voltage rated for the unit to be used in a market country.
   - DC 6 V
2. EQ switch position: 120 μS, 70 μS
3. Output terminal: LINE Output
4. Test tape used: MTT-116U (120 μS)
   MTT-116K (70 μS)

PROCEDURES

1. Play the test tape MTT-116U and MTT-116K back. Let the 31.5 Hz and 14 kHz output level be 0 dB as reference level.
2. Read the 31.5 Hz to 14 kHz output level differences from the 315 Hz 0 dB reference level.
3. Proceed both for the right and left channels in the same manner.
4. For the above measurement, use the test tape MTT-116U for the EQ 120 μS position and MTT-116K for the EQ 70 μS position.

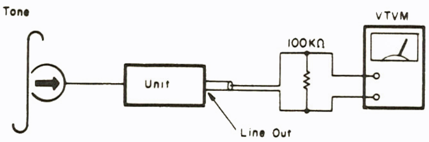
CAUTION

Since the test tapes used may involve same head azimuth difference, the head azimuth should be corrected at the highest frequency of each test tape before measurement.

STANDARD

In reference to the 315 Hz, 0 dB signal output level,
+4 to –4 at 40 Hz
+4 to –6 at 12.5 kHz

Mode: playback



5B-16 Record-Playback Output Level Measurement (at LINE OUT)

SET UP

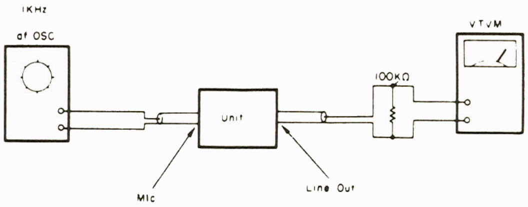
1. Power voltage:
   - 50/60 Hz AC voltage rated for the unit to be used in a market country.
   - DC 6 V
2. Input: 1 kHz, –60 dB signal
3. Load: Measuring instrument input impedance
4. Level control position: SRL for recording operation
5. TAPE selector switch position: NORMAL, CrO_2 and Fe-Cr
6. Measuring output terminal' LINE OUT
7. Cassette tape used: TDK AC-211, AC-511 and SONY CS-30

PROCEDURES

1. Record the 1 kHz, –60 dB signal in the normal recording state.
2. Rewind the recorded part of tape and play it back. Read the VTVM indication.
3. Proceed for the NORMAL' CrO_2 and Fe-Cr positions each in the same manner.
4. Proceed both for the right and left channels in the same manner.

STANDARDS

1. NORMAL position: 560 mV ±2 dB
2. CrO_2 position: 560 mV ±2 dB
3. Fe-Cr position: 560 mV ±2 dB



5B-17 Record-Playback, Harmonic Distortion Measurement

SET UP

1. Power voltage:
   - ● 50/60 Hz AC voltage rated fro the unit to be used in a market country.
   - ● DC 6 V
2. Input: 1 kHz, −60 dB signal
3. Playback output level: Same as the recorded signal level
4. Load: Measuring instrument input impedance
5. Measuring output terminal: LINE Output
6. Cassette tape used: TDK AC-211, AC-511 and SONY CS-30

PROCEDURES

1. Record the 1 kHz signal in the normal recording state.
2. Play the recorded signal back in the normal playback state. Calibrate the harmonic distortion meter to 100% at the INPUT CONT. Adjust the adjusting knob for minimum meter pointer deflection, and read the harmonic distortion.
3. Proceed both for the right and left channels in the same manner.
4. Proceed for the NORMAL, CrO2 and Fe-Cr positions each in the same manner.

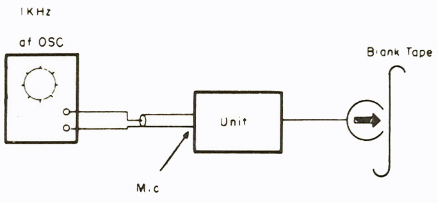
STANDARDS

1. Less than 2.5% for the NORMAL and CrO2 positions.
2. Less than 3.5% for the Fe-Cr position.

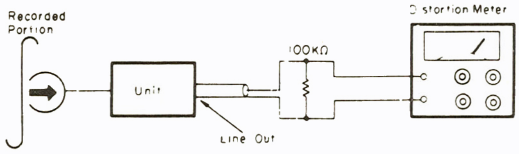
CAUTIONS

1. Be sure to demagnetize the heads as the measured values may deviate from the accurate values.
2. Note that excessive wow and flutter also causes deviation of the measured values.

Mode: record



Mode: playback



5B-18 Record-Playback Signal-to-Noise Ratio Measurement

SET UP

1. Power voltage:
   - ● 50/60 Hz AC voltage rated for the unit to be used in a market country.
   - ● DC 6 V
2. Input: 1 kHz, −60 dB signal
3. Playback output level: Same as the recorded signal level
4. Load: Measuring instrument input impedance
5. Measuring output terminal: LINE Output
6. Cassette tape used: TDK AC-211, AC-511 and SONY CS-30

PROCEDURES

1. Record the 1 kHz signal in 3 dB above the normal recording state.
2. Disconnect the input signal from the microphone jack. In this state, record no signal.
3. Play the 1 kHz signal back in the normal playback state with the use of the I.E.C. A-Curve Filter. Let the output level be 0 dB as reference level.
4. Read difference between the recorded 0 dB reference output and no-signal output levels.
5. Proceed both for the right and left channels in the same manner.
6. Set the DOLBY switch to the ON position, and proceed with similar measurement.

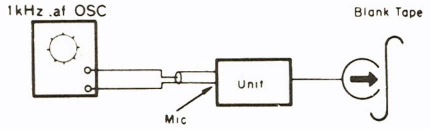
STANDARDS

1. Greater than 56 dB for the ON position of the DOLBY switch.
2. Greater than 46 dB for the OFF position of the DOLBY switch.

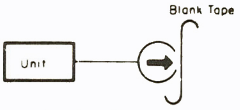
CAUTION

Arrange the CD-320 power cord for minimum hum component.

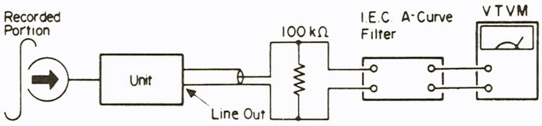
Mode: record



Mode: record



Mode: playback



5B-19 Record-Playback Frequency Response Measurement

SET UP

1. Power voltage: Only when the 6 V DC power voltage is primary for the unit and this power voltage is unavailable, use AC power supply.
2. Input: 1 kHz, -60 dB signal with -20 dB as 0 VU
3. Playback output level: Same as the recorded signal level.
4. Load: Measuring instrument input impedance
5. Measuring output terminal: LINE Output
6. Cassette tape used: TDK AC-211, AC-511 and SONY CS-30

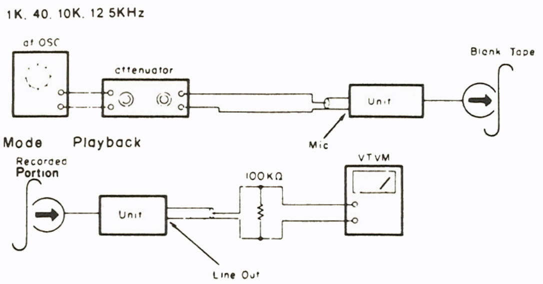
PROCEDURES

1. Record the 1 kHz signal in the normal recording state. In turn, reduce the input level by 20 dB with an attenuator. Then, record the 1 kHz, 40 Hz, 10 kHz, 13 kHz, 14 kHz and 15 kHz signals.
2. Play the recorded 1 kHz signal back in the normal playback state.
3. Let the 1 kHz, -20 dB-down signal level be 0 dB as reference level. Read difference of the 40 Hz, 10 kHz, 13 kHz, 14 kHz and 15 kHz signal output levels from the 1 kHz signal 0 dB reference level.
4. Proceed for the NORMAL, CrO_2 and Fe-Cr positions each in the same manner.
5. Proceed both for the right and left channels in the same manner.

STANDARDS

1. NORMAL position:
   40 Hz ~ 10 kHz .... +4, -6 dB
   with DOLBY switch at OFF
2. CrO_2 position:
   40 Hz ~ 12.5 kHz .... +4, -6 dB
   with DOLBY switch at OFF
3. Fe-Cr position:
   40 Hz ~ 12.5 kHz .... +4, -6 dB
   with DOLBY switch at OFF
4. NORMAL CrO_2 and Fe-Cr positions:
   40 Hz ~ 12.5 kHz .... +5, -7 dB
   with DOLBY switch at ON

Mode: record



5B-20 Erasing Effect Measurement

SET UP

1. Power voltage: Only when the 6 V DC power voltage is primary for the unit and this power voltage is unavailable, use AC power supply.
2. Input: 100 Hz, -60 dB signal with +10 dB as 0 VU.
3. Playback output level: Same as the recorded signal level.
4. Load: Measuring instrument input impedance
5. TAPE selector switch position: NORMAL, CrO_2 and Fe-Cr
6. Cassette tape used: TDK AC-211, AC-511 and SONY CS-30
7. Filter used: 100 Hz band-pass filter

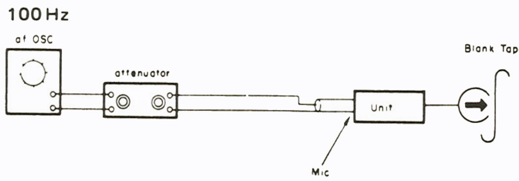
PROCEDURES

1. Record the 100 Hz input signal in the normal recording state.
2. In turn, increase the input level by 10 dB with the attenuator, and record it.
3. Rewind a half portion of the 10 dB-up tape and record in no-signal state, or erase, on the portion with the input signal disconnected from the microphone jack.
4. Play back in the normal playback state the input signal recorded in the normal recording state.
5. In turn, let the 10 dB-up recorded signal level be 0 dB as reference level. Read difference of the level at the erased portion from the 0 dB reference level.

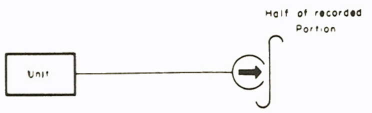
STANDARD

Greater than 55 dB.

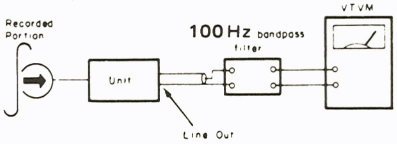
Mode: record



Mode: record



Mode: playback



5B-21 Leak Bias Measurement

SET UP

1. Power voltage:
   - 50/60 Hz AC voltage rated for the unit to be used in a market country.
   - DC 6 V
2. Input: 1 kHz, −60 dB signal
3. Load: Measuring instrument input impedance
4. Level control position: SRL
5. Tape selector switch position: NORMAL CrO_2 and Fe-Cr

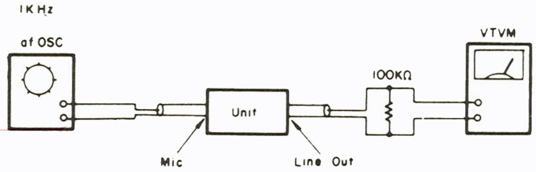
PROCEDURES

1. Record the 1 kHz input signal in the normal recording state. Let the monitor output level at the LINE OUT terminal be 0 dB as reference level. Read difference of the output level having the input signal disconnected from the 0 dB reference level.
2. Proceed both for the right and left channels in the same manner.

STANDARD

Lower than −47 dB

Mode: reocrd



5B-22 Cross Talk Measurement

SET UP

1. Power voltage:
   - 50/60 Hz AC voltage rated for the unit to be used in a market country.
   - DC 6 V
2. TAPE selector switch position: NORMAL
3. Load: Measuring instrument input impedance
4. Measuring output terminal: LINE Output
5. Test tape used: MTT-121

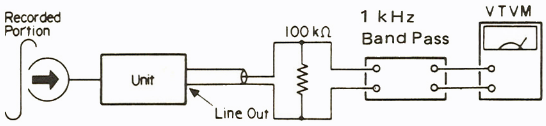
PROCEDURES

1. Playback the R channel on the side A of the test tape MTT-121. Assure that the output response at 1 kHz be 0 dB as reference level.
2. In turn, playback the R channel on the side B of the test tape MTT-121. Read the output level deviated from the 0 dB reference level.

STANDARD

Less than 55 dB

Mode: playback



5B-23 Channel Separation Measurement

SET UP

1. Power voltage:
   - 50/60 Hz AC voltage rated for the unit to be used in a market country.
   - DC 6 V
2. TAPE selector switch position: NORMAL
3. MONITOR switch position: TAPE
4. Load: Measuring instrument input impedance
5. Measuring output terminal: LINE Output
6. Test tape used: MTT-141

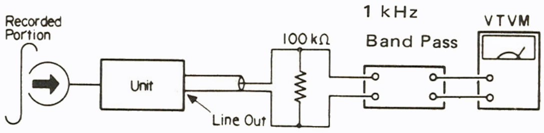
PROCEDURES

1. Playback the L channel of the test tape MTT-141. Assume that the output reference at 1 kHz be 0 dB as reference level.
2. In turn, playback the L channel. Read the output level from the 0 dB reference level.

STANDARD

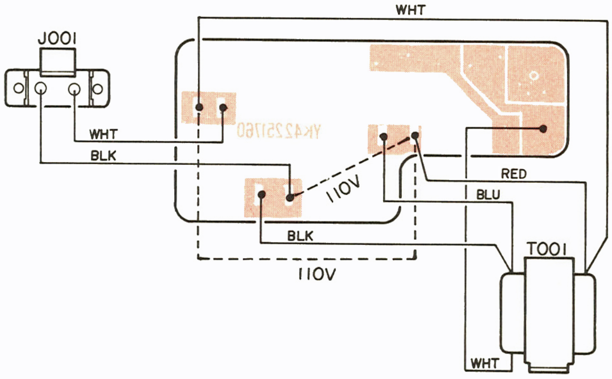
Less than 34 dB

Mode: playback

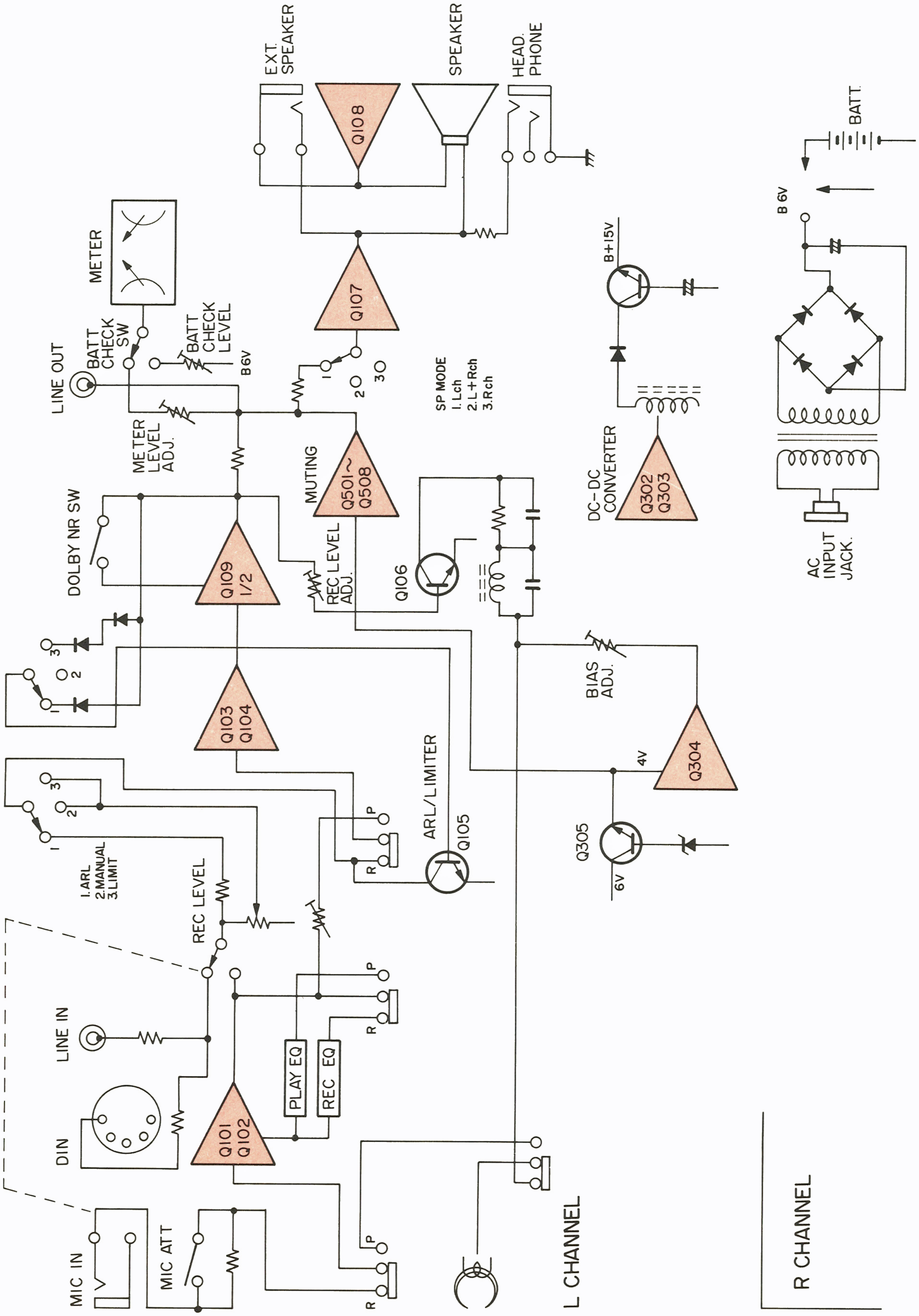


CHANGE OF POWER TRANSFORMER PRIMARY VOLTAGE (for Europe Model Only)

The CD-320 is wired for 220V line voltage. It can be operated with 110V AC by changing the power transformer lead wire as illustrated.

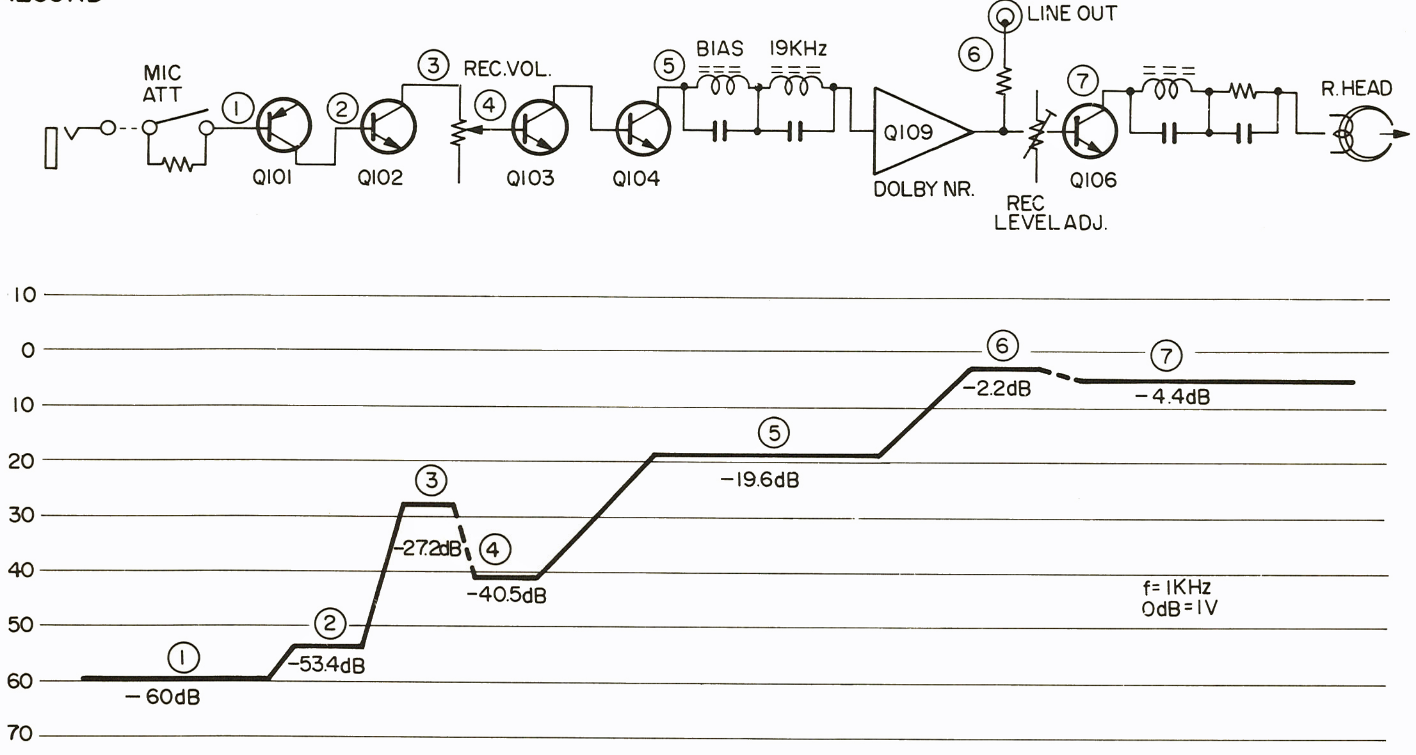


6. BLOCK DIAGRAM

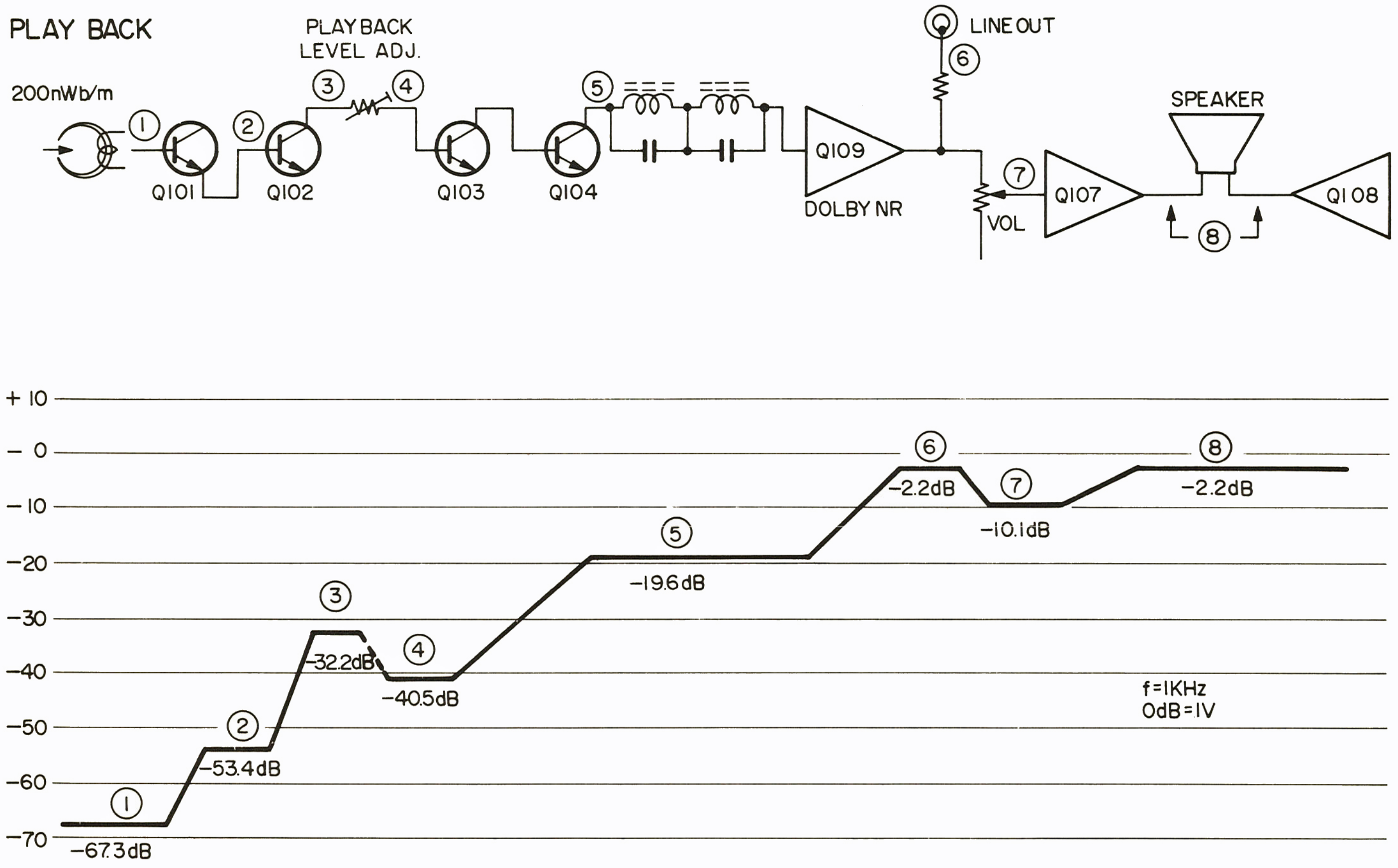

EXT. SPEAKER
Q108
SPEAKER
HEAD. PHONE
BATT.
B 6V
B+15V
METER
Q107
BATT CHECK SW
BATT CHECK LEVEL
B6V
LINE OUT
METER LEVEL ADJ.
SP MODE
1. Lch
2. L+Rch
3. Rch
1
2
3
MUTING
Q501~ Q508
DC-DC CONVERTER
Q302 Q303
AC INPUT JACK.
DOLBY NR SW
Q109 1/2
REC LEVEL ADJ.
Q106
3
2
1
BIAS ADJ.
Q103 Q104
ARL/LIMITER
Q105
4V
Q304
Q305
6V
3
2
1
1. ARL
2. MANUAL
3. LIMIT
REC LEVEL
P
R
P
R
LINE IN
PLAY EQ
REC EQ
DIN
Q101 Q102
MIC IN
MIC ATT
P
R
L CHANNEL
R CHANNEL

7. LEVEL DIAGRAM

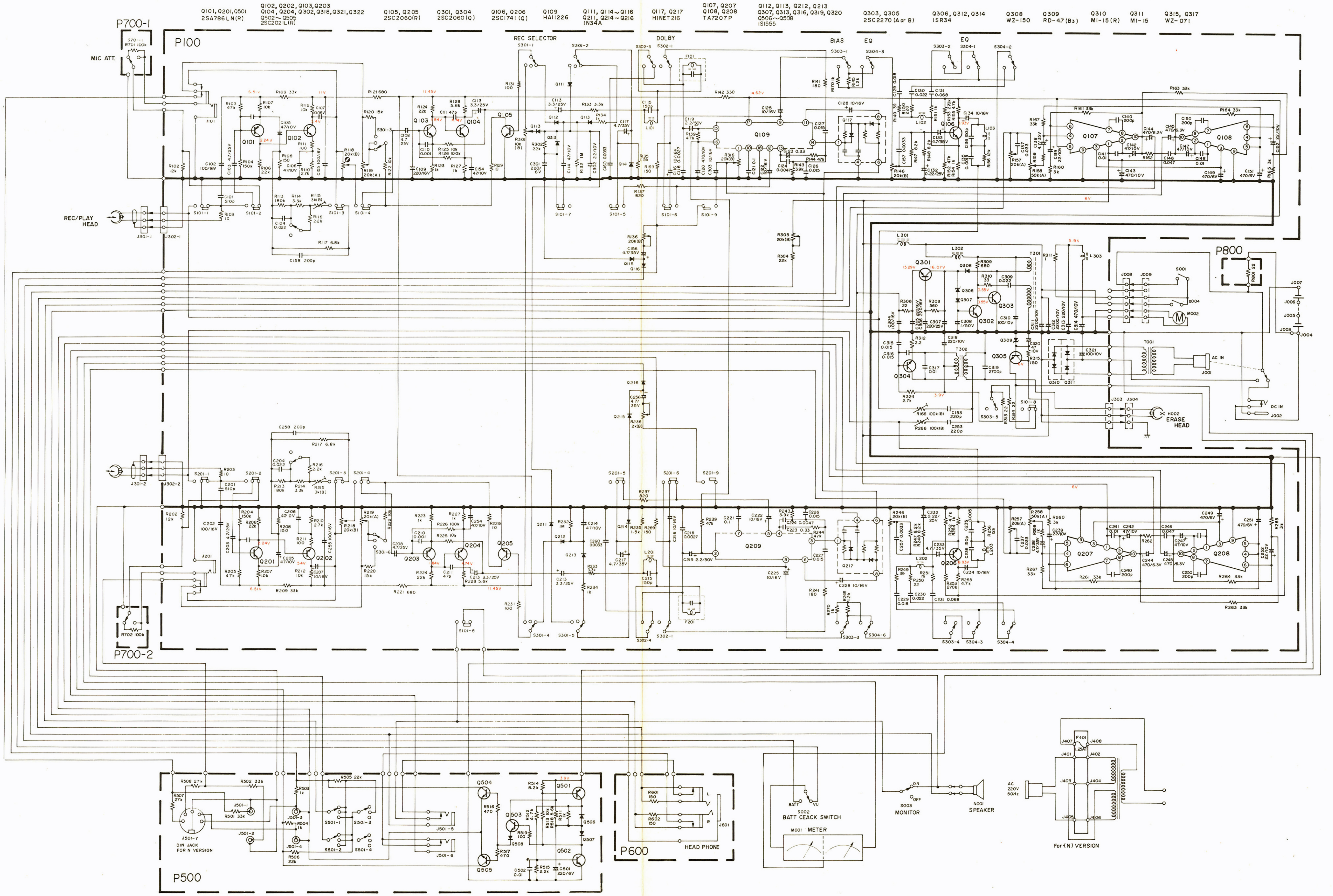
RECORD



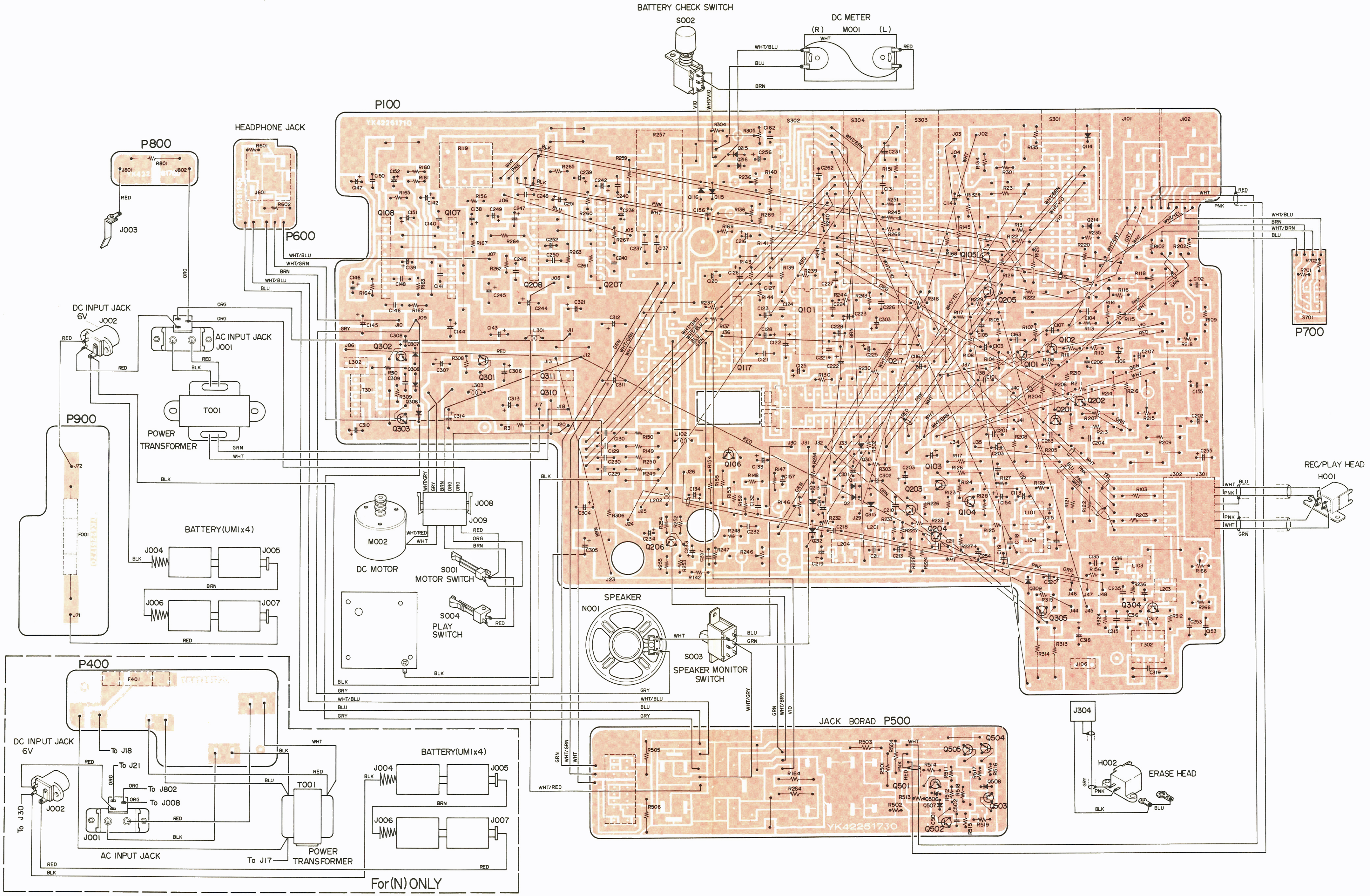
PLAY BACK



8. SCHEMATIC DIAGRAM

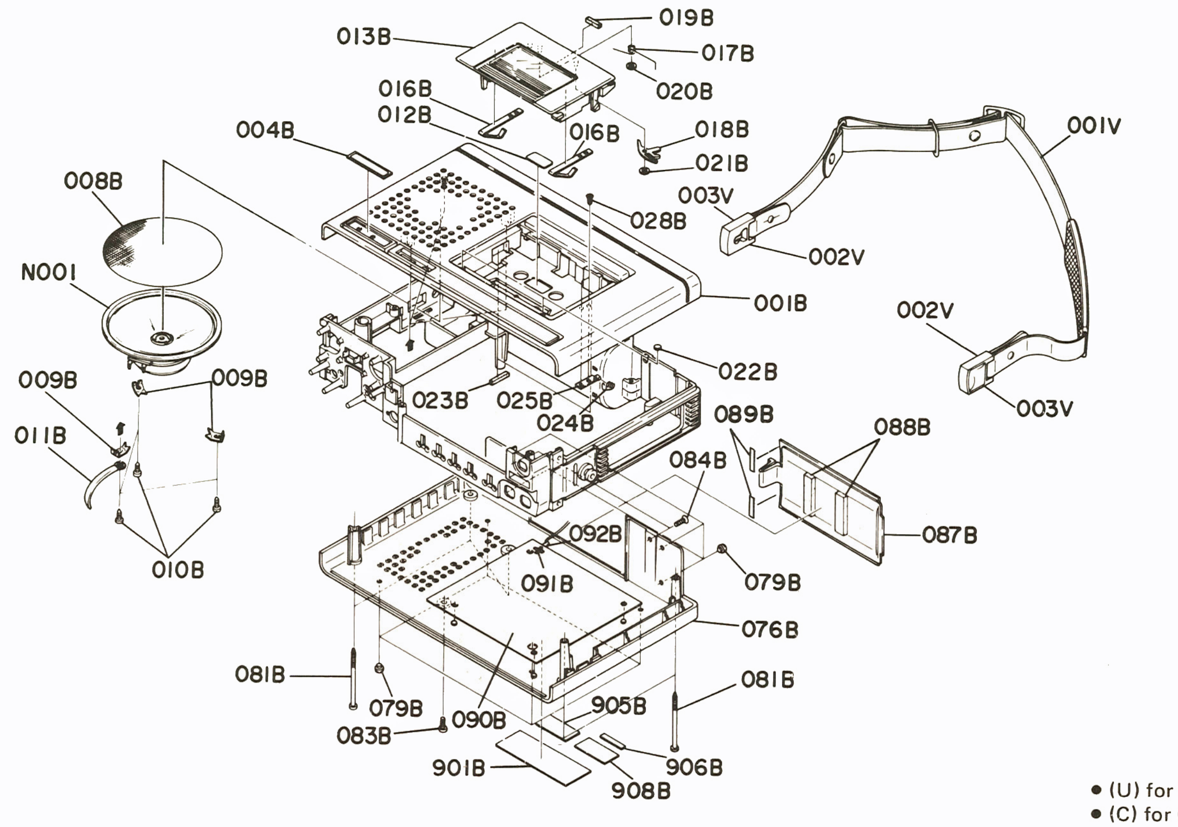

Q101, Q201, Q501 2SA786LN(R)
Q102, Q202, Q103, Q203 Q104, Q204, Q302, Q318, Q321, Q322 Q502～Q505 2SC2021L(R)
Q105, Q205 2SC2060(R)
Q301, Q304 2SC2060(Q)
Q106, Q206 2SC1741(Q)
Q109 HA11226
Q111, Q114～Q116 Q211, Q214～Q216 IN34A
Q117, Q217 HINET216
Q107, Q207 Q108, Q208 TA7207P
Q112, Q113, Q212, Q213 Q307, Q313, Q316, Q319, Q320 Q506～Q508 IS1555
Q303, Q305 2SC2270 (A or B)
Q306, Q312, Q314 ISR34
Q308 WZ-150
Q309 RD-4.7(B3)
Q310 MI-15(R)
Q311 MI-15
Q315, Q317 WZ-071
P700-1
MIC ATT.
P100
REC SELECTOR
DOLBY
BIAS
EQ
REC/PLAY HEAD
P800
AC IN
DC IN
ERASE HEAD
P700-2
P500
DIN JACK FOR N VERSION
P600
HEAD PHONE
S002 BATT CEACK SWITCH
M001 METER
S003 MONITOR
N001 SPEAKER
AC 220V 50Hz
For (N) VERSION

9. CIRCUIT BOARD DIAGRAM


BATTERY CHECK SWITCH
S002
DC METER
(R) M001 (L)
P100
P800
HEADPHONE JACK
P600
J003
DC INPUT JACK
6V
J002
AC INPUT JACK
J001
T001
POWER
TRANSFORMER
P900
BATTERY (UM1x4)
J004
J005
J006
J007
M002
DC MOTOR
J008
J009
S001
MOTOR SWITCH
S004
PLAY
SWITCH
SPEAKER
N001
S003
SPEAKER MONITOR
SWITCH
P700
REC/PLAY HEAD
H001
J304
H002
ERASE HEAD
JACK BORAD P500
P400
DC INPUT JACK
6V
To J18
To J21
To J802
To J008
To J30
J002
J001
AC INPUT JACK
To J17
T001
POWER
TRANSFORMER
BATTERY(UM1x4)
J004
J005
J006
J007
For(N) ONLY

10. EXPLODED VIEW AND PARTS LIST

- **[C02-99] Top Cover and Bottom Lid**

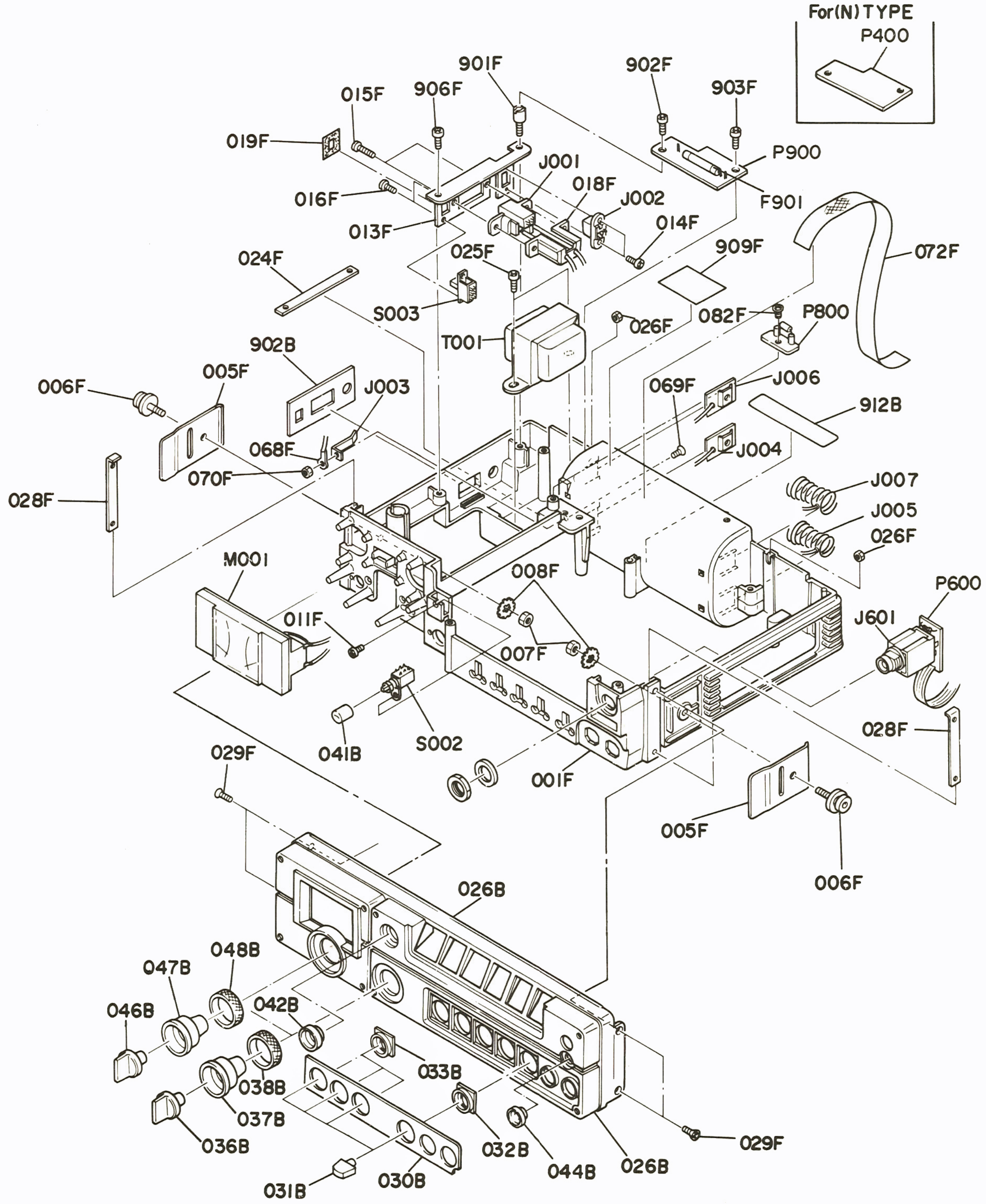

013B
019B
017B
020B
016B
012B
016B
018B
021B
004B
001V
008B
003V
028B
N001
002V
001B
002V
009B
009B
022B
023B
025B
024B
089B
088B
003V
011B
084B
092B
087B
010B
091B
079B
076B
081B
081B
079B
905B
083B
090B
906B
901B
908B

- (U) for U.S.A.
- (C) for Canada
- (N) for Europe

REF. DESIG.	Q'TY U	Q'TY C	Q'TY N	PART NO.	DESCRIPTION
*	1			4226064400	Case Assembly (A.B.C.D)
*		1		4226064410	Case Assembly (A.B.C1.D)
*			1	4226064420	Case Assembly (A.B.C2.D)
A	1	1	1	4226064430	Case Assembly, Top
001B	1	1	1	4223064082	Case
004B	1	1	1	4170251020	Badge
008B	1	1	1	3426202022	Net
012B	1	1	1	3347274010	Reflector
022B	2	2	2	3412056062	Buffer
023B	2	2	2	3426056020	Buffer
C	1			4226257400	Lid Assembly, Bottom
C1		1		4226257410	Lid Assembly
C2			1	4226257420	Lid Assembly
076B	1	1	1	4223257032	Lid
079B	8	8	8	3441057010	Leg
090B	1	1	1	4223109010	Shield
091B	1	1	1	56483040E0	Eyelect
092B	1	1	1	62031340W0	Lug
901B	1			4226265010	Indicator
901B		1		4226265020	Indicator
901B			1	4226265030	Indicator
D	1	1	1	4224257430	Lid Assembly, Battery
087B	1	1	1	4223257040	Lid
088B	2	2	2	3411056050	Buffer
089B	2	2	2	4226107010	Sheet

REF. DESIG.	Q'TY U	Q'TY C	Q'TY N	PART NO.	DESCRIPTION
F	1	1	1	4224064450	Case Assembly, Cassette
013B	1	1	1	4223064512	Case
016B	2	2	2	4223115050	Spring
017B	1	1	1	4223115040	Spring
018B	1	1	1	3411354142	Lever
019B	1	1	1	3411056070	Buffer
020B	1	1	1	54020301E0	Washer
021B	1	1	1	54022601E0	Washer
G	1	1	1	4223156400	Strap Assembly
001V	1	1	1	4223156010	Strap
002V	2	2	2	3411155012	Hanger
003V	2	2	2	3411063140	Escutcheon
009B	3	3	3	4170005010	Clamper
010B	3	3	3	51280308B0	B.H. Tapped Screw B3 x 8
011B	1	1	1	1210005010	Clamper
024B	1	1	1	4223115013	Spring
025B	1	1	1	4223160070	Bracket
028B	2	2	2	51040204S0	F.H.M. Screw F2 x 4
081B	5	5	5	51284029S0	B.H. Tapped Screw B3 x 60
083B	1	1	1	51100308S9	B.H.M. Screw B3 x 8
084B	2	2	2	51140310S9	O.C.H.M. Screw 3 x 10
905B		1		2457861040	Label
905B			1	9510911040	Label
905B	1			9511201100	Label
906B		1		9510911050	Label
908B		1		4156861010	Label
N001	1	1	1	QK01002100	Speaker

- **[C02-99] Front Case and Chassis Assembly**


For(N) TYPE
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902F
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P900
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018F
F901
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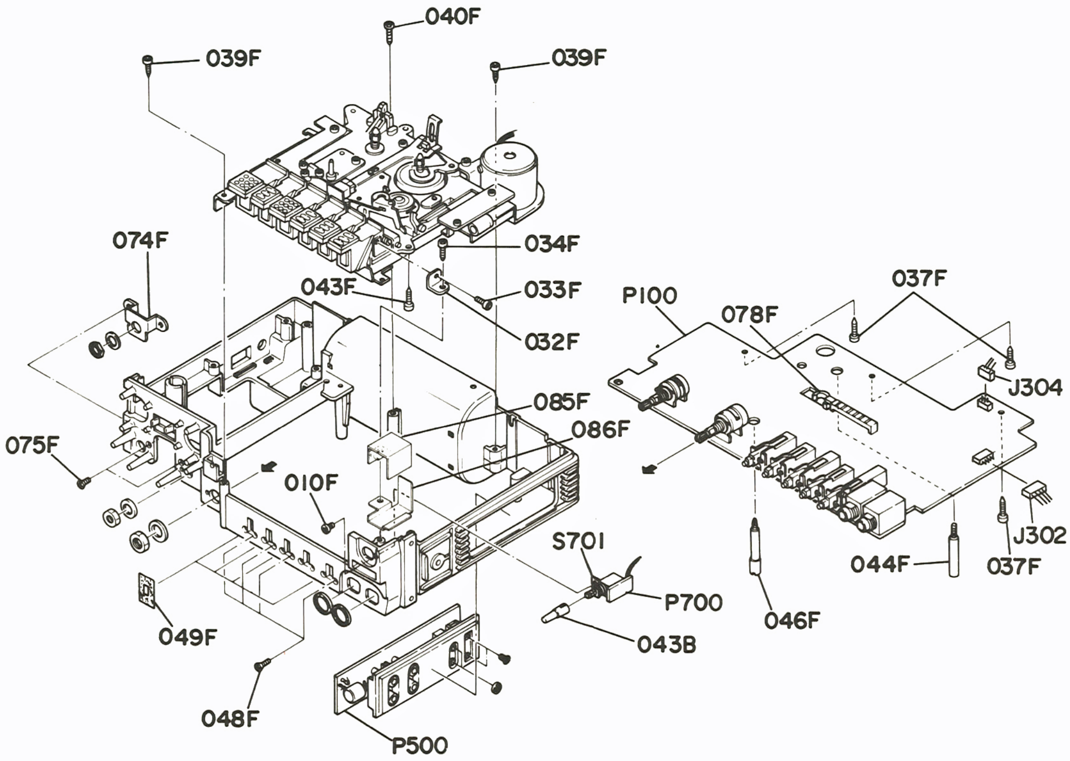
J002
013F
014F
909F
072F
024F
025F
S003
026F
082F
P800
902B
T001
005F
J003
069F
J006
006F
912B
068F
J004
070F
028F
J007
J005
026F
M001
008F
P600
011F
007F
J601
028F
041B
S002
029F
001F
005F
006F
026B
048B
047B
042B
046B
033B
038B
037B
036B
032B
029F
044B
026B
031B
030B

- (U) for U.S.A.
- (C) for Canada
- (N) for Europe

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
B	1	1	1	4226064440	Case Assembly, Front
026B	1	1	1	4225064020	Case
030B	1	1	1	4226063010	Escutcheon
032B	1	1	1	4223259010	Bushing
033B	3	3	3	4223259020	Bushing
042B	1	1	1	4223353032	Ring
044B	1	1	1	4223353042	Ring
E	1	1		4225105400	Chassis Assembly
E1			1	4223105410	Chassis Assembly
001F	1	1	1	4223105012	Chassis
005F	2	2	2	4223063030	Escutcheon
006F	2	2	2	4223112010	Shaft
007F	2	2	2	53110433A9	Nut
008F	2	2	2	54080400R0	Washer
024F	1	1	1	4223160060	Bracket
028F	2	2	2	4223160030	Bracket
072F	1	1	1	3397007010	Strip
902B	1	1		4225265040	Indicator
902B			1	4225265052	Indicator
912B	1	1	1	3397861020	Label
L	1	1	1	4223154400	Knob Assembly, Volume
037B	1	1	1	4223154050	Knob
038B	1	1	1	4223353010	Ring
M	1	1	1	4223154410	Knob Assembly, Rec/Speed
047B	1	1	1	4223154050	Knob
048B	1	1	1	4223353010	Ring
031B	4	4	4	4223154010	Knob
036B	1	1	1	4223154042	Knob
041B	1	1	1	4225154010	Knob, Battery Check
046B	1	1	1	4223154042	Knob, Rec Volume
011F	1	1	1	51102606A0	B.H.M. Screw B2.6 x 6
013F	1	1	1	4223160010	Bracket
014F	2	2	2	51100205A0	B.H.M. Screw B2 x 5
015F	2	2	2	51102610A0	B.H.M. Screw B2.6 x 10
016F	2	2	2	51100204A0	B.H.M. Screw B2 x 4
018F	1	1	1	3370053010	Cover
019F	1	1	1	4223107040	Sheet
025F	2	2	2	51100306A9	B.H.M. Screw B3 x 6
026F	2	2	2	53110303A9	Hexagon Nut
029F	4	4	4	51040308A9	F.H.M. Screw F3 x 8

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
068F	1	1	1	62021030W0	Lug
069F	1	1	1	51040206S0	F.H.M. Screw F2 x 6
070F	1	1	1	53110203A0	Hexagon Nut
082F	1	1	1	51280308B0	B.H. Tapped Screw B3 x 8
901F	1	1	1	4223101020	Support
902F	1	1	1	51100306A9	B.H.M. Screw B3 x 6
903F	1	1	1	51280310B0	B.H. Tapped Screw B3 x 10
906F	1	1	1	51280308B0	B.H. Tapped Screw B3 x 8
909F		1		2911861162	Label
909F	1			9510221010	Label
J001			1	YJ04000500	AC Jack
J001	1	1		YJ04000510	AC Jack
J002	1	1	1	YJ04000550	DC Jack
J003	1	1	1	YL12010720	Terminal, Rechargeable
J004	1	1	1	YL12010710	Terminal (+)
J005	1	1	1	YL11010090	Terminal (—)
J006	1	1	1	YL12010710	Terminal (+)
J007	1	1	1	YL11010090	Terminal (—)
M001	1	1	1	IM12045030	D.C. Meter
S002	1	1	1	SP02020340	Push Switch, Batt. Check
S003	1	1	1	SS02020520	Slide Switch
T001	1	1		TS14803200	Power Transformer
T001			1	TS14803270	Power Transformer
P400			1	YK42261720	P.W. Board, Power Supply
			1	ZZ42261720	P.W. Board Assembly
P600	1	1	1	YK42261740	P.W. Board, Headphone
	1	1	1	ZZ42261740	P.W. Board Assembly
J601	1	1	1	YJ01001120	Jack, Headphone
P800	1	1	1	YK42261760	P.W. Board, Rechargeable
	1	1	1	ZZ42261760	P.W. Board Assembly
P900	1	1		YK42261770	P.W. Board, Fuse
	1	1		ZZ42261770	P.W. Board Assembly
F901	1	1		FS20250910	Fuse 2.5A 250V

- **[M01-99] Rec/Play P.W. Board**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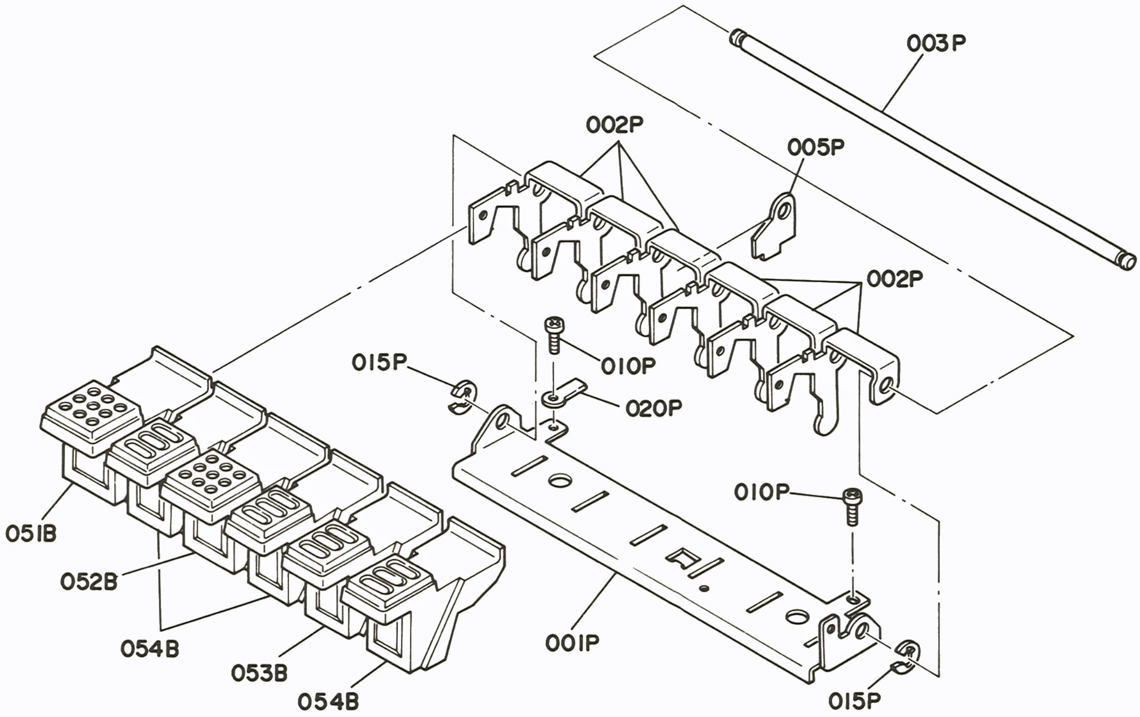
P100
078F
037F
032F
J304
085F
086F
075F
010F
S701
J302
044F
037F
P700
043B
046F
049F
048F
P500

- (U) for U.S.A.
- (C) for Canada
- (N) for Europe

REF. DESIG.	Q'TY U	C	N	PART NO.	DESCRIPTION
010F	1	1	1	51102606A0	B.H.M. Screw B2.6 x 6
032F	1	1	1	4223160020	Bracket
033F	1	1	1	51060304A9	P.H.M. Screw P3 x 4
034F	1	1	1	51280308B0	B.H. Tapped Screw B3 x 8
037F	3	3	3	51280308B0	B.H. Tapped Screw B3 x 8
039F	2	2	2	51280308B0	B.H. Tapped Screw B3 x 8
040F	1	1	1	51280312B0	B.H. Tapped Screw B3 x 12
043F	1	1	1	51280310B0	B.H. Tapped Screw B3 x 10
044F	1	1	1	4223101030	Support
046F	1	1	1	4223101010	Support
048F	4	4	4	51040306S9	F.H.M. Screw F3 x 6
043B	1	1	1	4223154030	Knob, Mic ATT.

REF. DESIG.	Q'TY U	C	N	PART NO.	DESCRIPTION
049F	4	4	4	4223107020	Sheet
074F	1	1	1	4225160010	Bracket
075F	2	2	2	51040306A9	F.H.M. Screw F3 x 6
078F	1	1	1	4226354010	Lever
085F	1	1	1	4226109010	Shield
086F	1	1	1	4226109020	Shield
J302	1	1	1	YB00250040	Connector (6P)
J304	1	1	1	YB00340010	Connector (3P)
P100	1	1	1	YK42261710	P.W. Board, Rec/Play
	1	1	1	ZZ42261710	P.W. Board Assembly
P500	1	1	1	YK42261730	P.W. Board, Jack
	1	1		ZZ42261730	P.W. Board Assembly
			1	ZZ42268730	P.W. Board Assembly
P700	1	1	1	YK42261750	P.W. Board, Mic ATT.
	1	1	1	ZZ42261750	P.W. Board Assembly
S701	1	1	1	SP02020360	Push Switch, Mic ATT.

- **[P01-99] Operation Levers and Buttons**



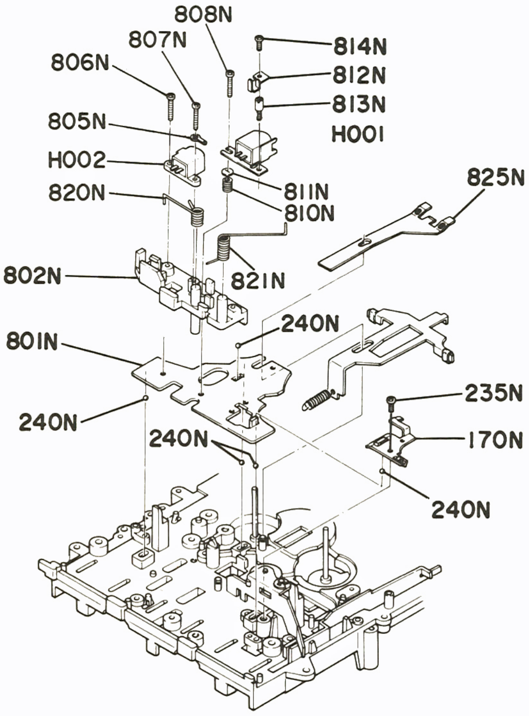
- (U) for U.S.A.
- (C) for Canada
- (N) for Europe

REF. DESIG.	Q'TY U	Q'TY C	Q'TY N	PART NO.	DESCRIPTION
H	1	1	1	4223270400	Button Assembly (Rec)
051B	1	1	1	4223270013	Button
002P	1	1	1	4382354060	Lever
I	1	1	1	4223270410	Button Assembly (Play)
052B	1	1	1	4223270023	Button
002P	1	1	1	4382354060	Lever
J	1	1	1	4223270420	Button Assembly (Stop)
053B	1	1	1	4223270032	Button
002P	1	1	1	4382354060	Lever
K	3	3	3	4223270430	Button Assembly (F.F. Rew, Pause)
054B	3	3	3	4223270042	Button
002P	3	3	3	4382354060	Lever

REF. DESIG.	Q'TY U	Q'TY C	Q'TY N	PART NO.	DESCRIPTION
001P	1	1	1	4382160030	Bracket
003P	1	1	1	4382112110	Shaft
005P	1	1	1	4382104020	Retainer
010P	2	2	2	51300308B0	P.H. Tapped Screw P3 x 8
015P	2	2	2	64000400R0	RG Ring, E Type
020P	1	1	1	1126005010	Clamper

- (U) for U.S.A.
- (C) for Canada
- (N) for Europe

● [P02-99] **Head Chassis**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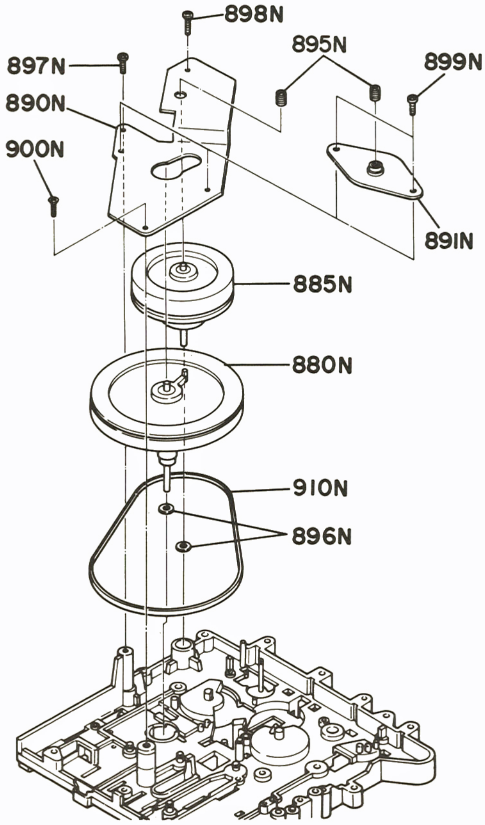
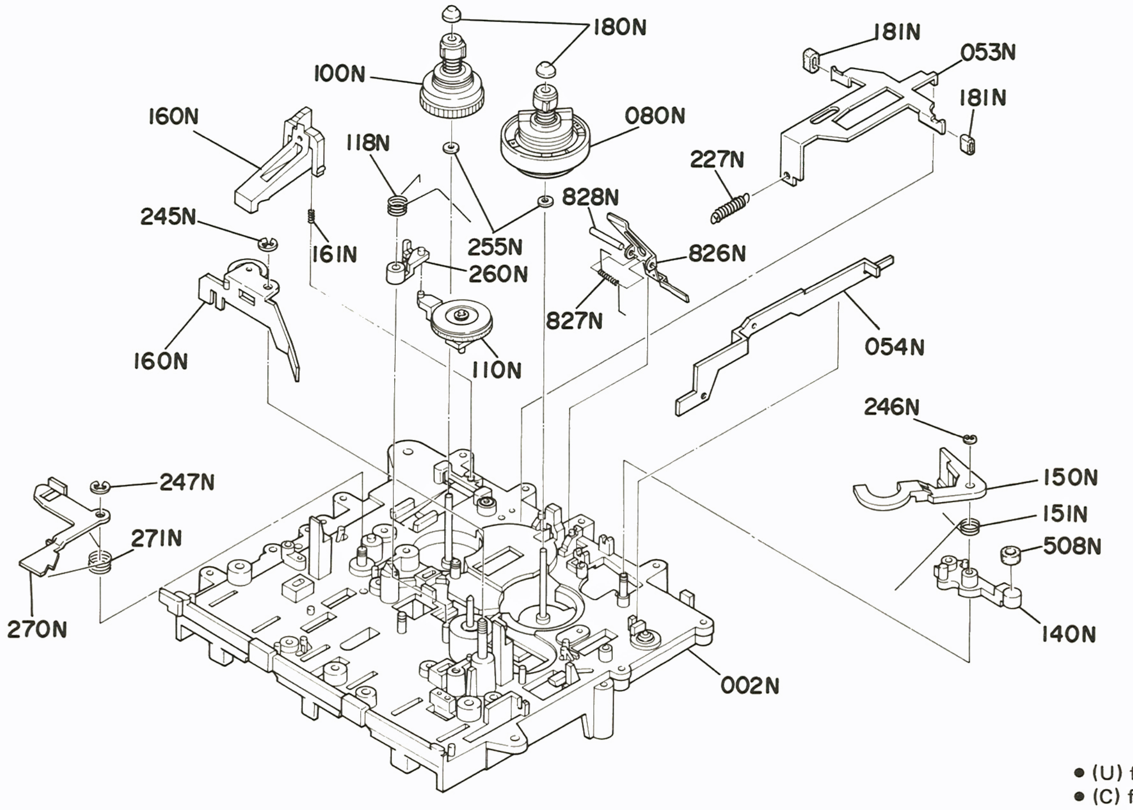
814N
812N
813N
H001
805N
H002
820N
811N
810N
825N
802N
821N
240N
801N
235N
240N
240N
170N
240N

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION	
	U	C	N			
170N	1	1	1	4367115172	Spring	
235N	1	1	1	51300308B0	P.H. TAP. Screw	P3 x 8
240N	5	5	5	61020010T0	Ball	
801N	1	1	1	4367105023	Chassis	
802N	1	1	1	4367160015	Bracket	
805N	1	1	1	62021030W0	Lug	
806N	1	1	1	51100212A0	B.H.M. Screw	B2 x 12
807N	1	1	1	51100210A0	B.H.M. Screw	B2 x 10
808N	1	1	1	51100210A0	B.H.M. Screw	B2 x 10
810N	1	1	1	4380115090	Spring	
811N	1	1	1	3444118070	Spacer	
812N	1	1	1	4380005010	Clamper	
813N	1	1	1	4380101032	Support	
814N	1	1	1	51100203A0	B.H.M. Screw	B2 x 3
820N	1	1	1	4367115053	Spring	
821N	1	1	1	4367115042	Spring	
825N	1	1	1	4380115010	Spring	
H001	1	1	1	LH42851030	Rec/Play Head	
H002	1	1	1	LH31000450	Erase Head	


898N
895N
897N
899N
890N
900N
891N
885N
880N
910N
896N

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION	
	U	C	N			
880N	1	1	1	4382273500	Flywheel	
885N	1	1	1	4382273510	Flywheel	
890N	1	1	1	4382104010	Retainer	
891N	1	1	1	4382104700	Retainer	
895N	2	2	2	3483164020	Adjuster	
896N	2	2	2	59264702G9	Washer	
897N	1	1	1	51300310B0	P.H. TAP. Screw	P3 x 10
898N	1	1	1	51060306A9	P.H.M. Screw	P3 x 6
899N	2	2	2	51060305A9	P.H.M. Screw	P3 x 5
900N	1	1	1	51340310P0	F.H. TAP. Screw	F3 x 10
910N	1	1	1	4382264012	Belt	

- **[P04-99] (1/2) Parts Assembled on the Top of the Chassis**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053N
181N
160N
118N
080N
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245N
828N
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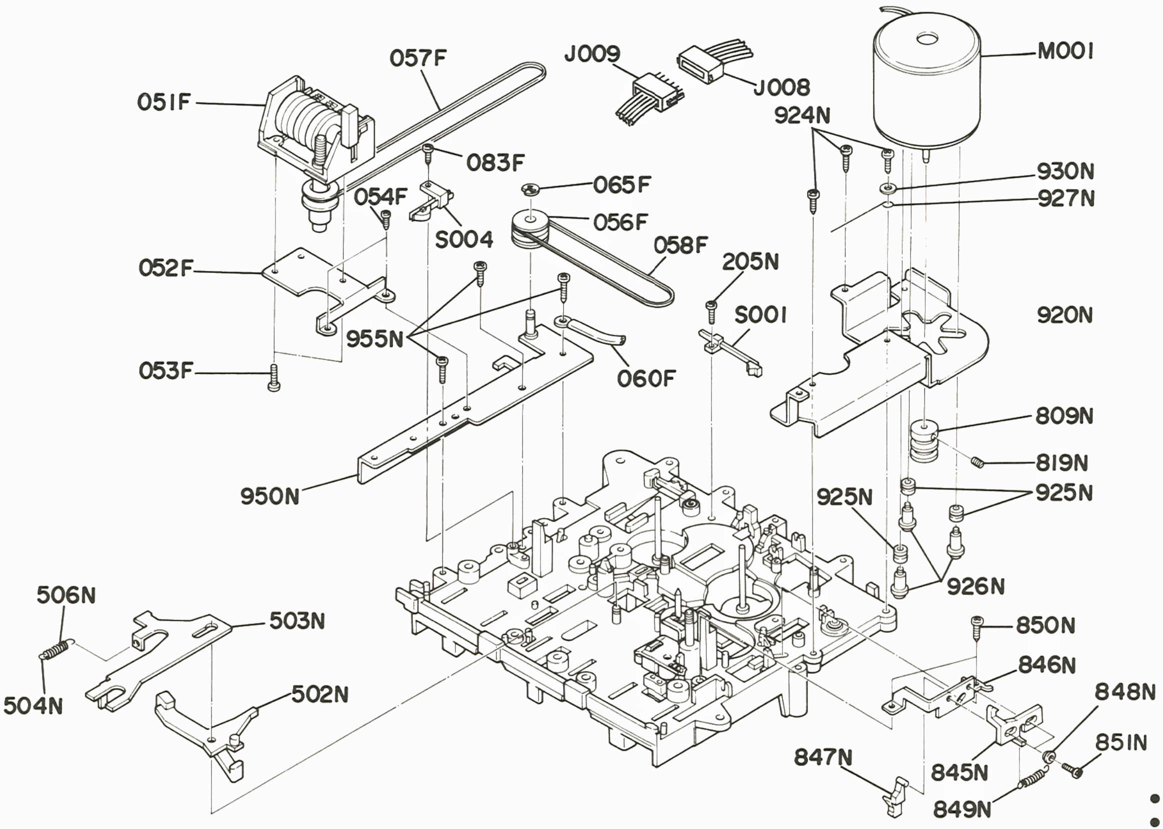
255N
260N
826N
827N
160N
110N
054N
246N
247N
150N
271N
151N
508N
270N
140N
002N

- (U) for U.S.A.
- (C) for Canada
- (N) for Europe

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
002N	1	1	1	4382105700	Chassis Assembly
053N	1	1	1	4367354092	Lever
054N	1	1	1	4367354123	Lever
060N	1	1	1	4367002702	Arm, Pinch Roller
080N	1	1	1	4367004703	Table
100N	1	1	1	4367004713	Table
110N	1	1	1	4367002730	Arm
118N	1	1	1	4367115310	Spring
140N	1	1	1	4367354773	Lever
150N	1	1	1	4367002054	Arm
151N	1	1	1	4367115130	Spring
160N	1	1	1	4367354084	Lever
161N	1	1	1	4367115072	Spring
180N	2	2	2	4367067010	Cap
181N	2	2	2	4367263010	Brake
227N	1	1	1	4367115210	Spring
245N	1	1	1	64002500R0	RG Ring, E Type
246N	1	1	1	64001500R0	RG Ring, E Type
247N	1	1	1	64000300R0	RG Ring, E Type
255N	2	2	2	59020402G9	Washer

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
260N	1	1	1	4367354110	Lever
270N	1	1	1	4380002013	Arm, Inter Lock
271N	1	1	1	4380115042	Spring
508N	1	1	1	4367055040	Collar
826N	1	1	1	4383115010	Spring
827N	1	1	1	4380115033	Spring
828N	1	1	1	4380112010	Shaft

- **[P04-99] (2/2) Parts Assembled on the Top of the Chassis**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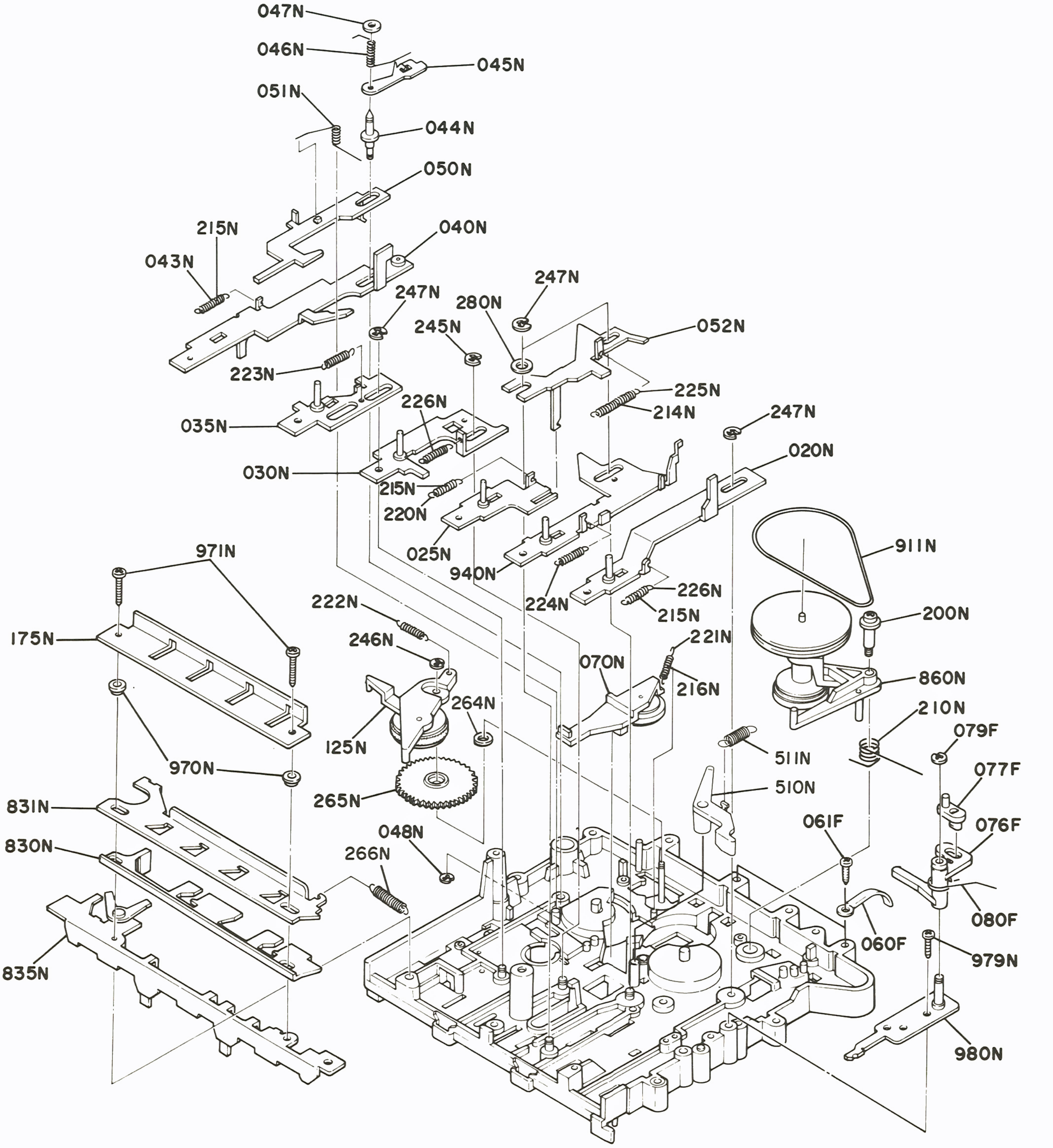
S001
920N
955N
053F
060F
809N
819N
950N
925N
925N
926N
506N
503N
850N
846N
504N
502N
848N
851N
847N
845N
849N

- (U) for U.S.A.
- (C) for Canada
- (N) for Europe

REF. DESIG.	Q'TY U	Q'TY C	Q'TY N	PART NO.	DESCRIPTION
051F	1	1	1	4225052010	Counter
052F	1	1	1	4223160040	Bracket
053F	2	2	2	51100305A9	B.H.M. Screw B3 x 5
054F	2	2	2	51060305A9	P.H.M. Screw P3 x 5
056F	1	1	1	4223262010	Pulley
057F	1	1	1	4223264010	Belt
058F	1	1	1	4223264020	Belt
060F	1	1	1	1210005010	Clamper
065F	1	1	1	64000300R0	RG Ring E Type
083F	1	1	1	51382608P0	P.H. Tapped Screw P2.6 x 8
205N	1	1	1	51382608P0	P.H. Tapped Screw P2.6 x 8
502N	1	1	1	4367002093	Arm, Cue REW
503N	1	1	1	4367354152	Lever
504N	1	1	1	4367115320	Spring
506N	1	1	1	4367056050	Buffer

REF. DESIG.	Q'TY U	Q'TY C	Q'TY N	PART NO.	DESCRIPTION
809N	1	1	1	4382262030	Pulley
819N	1	1	1	51610203A0	Set Screw, F.P. 2 x 3
845N	1	1	1	4384258010	Hook
846N	1	1	1	4384160010	Bracket
847N	1	1	1	4384002012	Arm
848N	2	2	2	4384055020	Collar
849N	1	1	1	4384115010	Spring
850N	2	2	2	51382608P0	P.H. Tapped Screw P2.6 x 8
851N	2	2	2	51060205A0	P.H.M. Screw P2 x 5
920N	1	1	1	4382160750	Bracket
924N	3	3	3	51300308B0	P.H. Tapped Screw P3 x 8
925N	3	3	3	4383259010	Bushing
926N	3	3	3	4367112150	Shaft
927N	1	1	1	4382115080	Spring
930N	1	1	1	54010300E0	Flat Washer, S
950N	1	1	1	4382160730	Blacket
955N	3	3	3	51300308B0	P.H. Tapped Screw P3 x 8
M001	1	1	1	MM10600530	D.C. Motor 6V 2400 rpm
S001	1	1	1	SM01010680	Mini Switch, Motor
S004	1	1	1	SM01010512	Mini Switch, Rec/Play AMP.
J008	1	1	1	YB00350030	Connective Cord 6P
J009	1	1	1	YB00280010	Connective Cord 6P

- **[P05-99] Parts Assembled on the Reverse of the Chassis**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052N
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214N
035N
226N
247N
020N
030N
215N
220N
025N
911N
971N
940N
226N
224N
215N
222N
200N
175N
246N
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070N
216N
860N
264N
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125N
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077F
510N
831N
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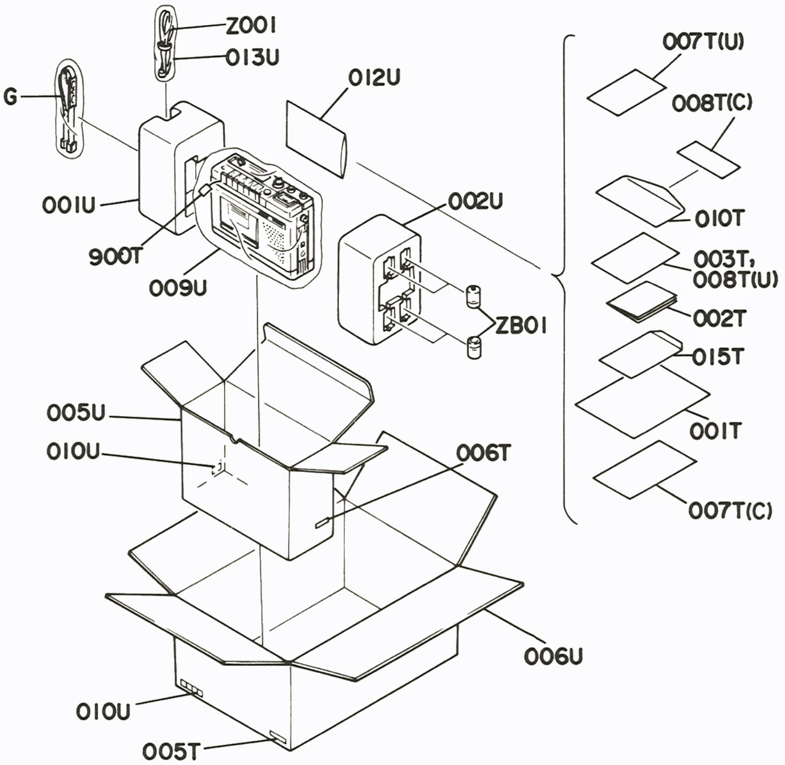
061F
076F
048N
830N
266N
080F
060F
979N
835N
980N

- (U) for U.S.A.
- (C) for Canada
- (N) for Europe

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
020N	1	1	1	4382354702	Lever, Rec.
025N	1	1	1	4380354723	Lever, Play
030N	1	1	1	4380354734	Lever, FF/CUE
035N	1	1	1	4380354743	Lever, Stop
040N	1	1	1	4380354754	Lever, Pause
043N	1	1	1	4367115210	Spring
044N	1	1	1	4367112134	Shaft
045N	1	1	1	4367054032	Cam
046N	1	1	1	4382115060	Spring
047N	1	1	1	59020805G9	Washer
048N	1	1	1	64001500R0	RG Ring, E Type
050N	1	1	1	4367354070	Lever, Eject
051N	1	1	1	4380115082	Spring
052N	1	1	1	4367354064	Lever
070N	1	1	1	4367354760	Lever, FF Idler
125N	1	1	1	4382002713	Arm
175N	1	1	1	4367051042	Guide
200N	1	1	1	4367112180	Shaft
210N	1	1	1	4382115052	Spring
214N	1	1	1	4367056040	Buffer
215N	3	3	3	4367056050	Buffer
216N	1	1	1	4367056030	Buffer
220N	1	1	1	4367115240	Spring
221N	1	1	1	4367115090	Spring
222N	1	1	1	4367115120	Spring
223N	1	1	1	4367115252	Spring
224N	1	1	1	4367115340	Sprng
225N	1	1	1	4367115270	Spring
226N	2	2	2	4367115282	Spring
245N	1	1	1	64002500R0	RG Ring, E Type

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
246N	1	1	1	64001500R0	RG Ring, E Type
247N	4	4	4	64000300R0	RG Ring, E Type
264N	1	1	1	4367118060	Spacer
265N	1	1	1	4367058500	Gear
280N	1	1	1	59046501G9	Washer
830N	1	1	1	4367054010	Cam
831N	1	1	1	4367054020	Cam
266N	1	1	1	4367115282	Spring
835N	1	1	1	4367051700	Guide
860N	1	1	1	4382001702	Idler
510N	1	1	1	4367002080	Arm
511N	1	1	1	4367115150	Spring
911N	1	1	1	4382264022	Belt
940N	1	1	1	4380354704	Lever, REW
970N	2	2	2	4367055023	Collar
971N	2	2	2	51280314B0	B.H. TAP. Screw B3 x 14
979N	1	1	1	51300308B0	P.H. TAP. Screw P3 x 8
980N	1	1	1	4382160742	Bracket
060F	2	2	2	1210005010	Clamper
061F	2	2	2	51280308B0	B.H. TAP. Screw B3 x 8
076F	1	1	1	4223354013	Lever
077F	1	1	1	4223354020	Lever
079F	1	1	1	64000300R0	RG Ring, E Type
080F	1	1	1	4223115023	Spring

- **[H01-99] Packing Materials**


Z001
013U
012U
007T(U)
G
008T(C)
001U
002U
010T
900T
003T,
008T(U)
009U
ZB01
002T
015T
005U
001T
010U
006T
007T(C)
006U
010U
005T

- (U) for U.S.A.
- (C) for Canada
- (N) for Europe

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
001T	1			4226851012	Instructions
001T		1	1	4225851313	Instructions
002T		1		9650000053	S. Station Card
003T		1		3917854013	Guarantee Card
005T	4		4	9510911040	Label
005T		4		9510911050	Label
006T		2		9510901040	Label
007T	1			2876851030	Instructions
007T		1		3369851320	Instructions
008T	1			3906854026	Guarantee Card
008T		1		9630000153	Guarantee Card
010T		1		2918813012	Envelope
015T	1			4183813010	Envelope
900T	1		1	9560000090	Hang Tag

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
001U	1	1	1	4223809010	Cushion
002U	1	1	1	4223809022	Cushion
005U	1		1	4226801012	Packing Case
005U		1		4225801022	Packing Case
006U	1	1	1	4225805010	Master Carton
009U	1	1	1	9012840010	Polyethy Bag
010U	2	2	2	9526019010	Serial No Card
012U	1	1	1	9011525010	Polyethy Bag
013U	1	1	1	9011020010	Polyethy Bag
Z001			1	ZC01805010	A.C. Power Coad
Z001	1	1		ZC02002040	A.C. Power Coad
ZB01	4	4		ZB01010070	Battery, UM-1

11. ELECTRICAL PARTS LIST

- ●(U) for U.S.A.
- ●(C) for Canada
- ●(N) for Europe

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
					P100-REC/PLAY AMP. CIRCUIT BOARD
P100	1	1	1	YK42261710	P.W. Board, Rec/Play Amp.
	1	1	1	ZZ42261710	P.W. Board Assembly
					P100-CAPACITORS
C101	1	1	1	DF55511510	Film 510pF ±5% 100V
C102	1	1	1	EA10701690	Elect 100µF 16V
C103	1	1	1	EE47502550	Elect 4.7µF 25V
C104	1	1	1	DF15223300	Film 0.022µF ±5%
C105	1	1	1	EA47601090	Elect 47µF 10V
C106	1	1	1	EA47601090	Elect 47µF 10V
C107	1	1	1	EA10601690	Elect 10µF 16V
C108	1	1	1	EE47502550	Elect 4.7µF 25V
C109	1	1	1	EA22701690	Elect 220µF 16V
C110	1	1	1	DF16102300	Film 0.001µF ±10%
C111	1	1	1	DD16470300	Ceramic 47pF ±10%
C113	1	1	1	EA33502590	Elect 3.3µF 25V
C114	1	1	1	EA47601090	Elect 47µF 10V
C115	1	1	1	DF55151510	Film 150pF ±5%
C116	1	1	1	EA10601690	Elect 10µF 16V
C117	1	1	1	EA47503590	Elect 4.7µF 35V
C118	1	1	1	DF16272300	Film 0.0027µF ±10%
C119	1	1	1	EA22505090	Elect 2.2µF 50V
C120	1	1	1	EA47701090	Elect 470µF 10V
C121	1	1	1	DF15104300	Film 0.1µF ±5%
C122	1	1	1	EA10601690	Elect 10µF 16V
C123	1	1	1	EM33402510	Elect 0.33µF 25V
C124	1	1	1	DF15472300	Film 0.0047µF ±5%
C125	1	1	1	EA10601690	Elect 10µF 16V
C126	1	1	1	DF15153300	Film 0.015µF ±5%
C127	1	1	1	DF15153300	Film 0.015µF ±5%
C128	1	1	1	EA10601690	Elect 10µF 16V
C129	1	1	1	DF16183300	Film 0.018µF ±10%
C130	1	1	1	DF16223300	Film 0.022µF ±10%
C131	1	1	1	DF16683300	Film 0.068µF ±10%
C132	1	1	1	EM22402510	Elect 0.22µF 25V
C133	1	1	1	EA47503590	Elect 4.7µF 35V
C134	1	1	1	EA10601690	Elect 10µF 16V
C135	1	1	1	DF16152300	Film 0.0015µF ±10%
C136	1	1	1	DF55151510	Film 150pF ±5%
C137	1	1	1	DF16333300	Film 0.033µF ±10%
C138	1	1	1	EA47503590	Elect 4.7µF 35V
C139	1	1	1	EA22601090	Elect 22µF 10V
C140	1	1	1	DD15201360	Ceramic 200pF ±5%
C141	1	1	1	DF16103300	Film 0.01µF ±10%
C142	1	1	1	EA47601090	Elect 47µF 10V
C143	1	1	1	EA47701090	Elect 470µF 10V
C144	1	1	1	EA47700690	Elect 470µF 6.3V
C145	1	1	1	EA47700690	Elect 470µF 6.3V
C146	1	1	1	DF16473300	Film 0.047µF ±10%
C147	1	1	1	EA47601090	Elect 47µF 10V
C148	1	1	1	DF16103300	Film 0.01µF ±10%
C149	1	1	1	EA47700690	Elect 470µF 6.3V
C150	1	1	1	DD15201360	Ceramic 200pF ±5%
C151	1	1	1	EA47700690	Elect 470µF 6V
C152	1	1	1	EA22601090	Elect 22µF 10V
C153	1	1	1	DF55221510	Film 220pF ±5%.
C154	1	1	1	EA47601090	Elect 47µF 10V
C155	1	1	1	EA10701690	Elect 100µF 16V
C156	1	1	1	EA47503590	Elect 4.7µF 35V
C157	1	1	1	DF16332300	Film 0.0033µF ±10%
C158	1	1	1	DD15201360	Ceramic 200pF ±5%
C201	1	1	1	DF55511510	Film 510pF ±5%
C202	1	1	1	EA10701690	Elect 100µF 16V
C203	1	1	1	EE47502550	Elect 4.7µF 25V
C204	1	1	1	DF15223300	Film 0.022µF ±5%
C205	1	1	1	EA47601090	Elect 47µF 10V
C206	1	1	1	EA47601090	Elect 47µF 10V
C207	1	1	1	EA10601690	Elect 10µF 16V
C208	1	1	1	EE47502550	Elect 4.7µF 25V
C210	1	1	1	DF16102300	Film 0.001µF ±10%
C211	1	1	1	DD16470300	Ceramic 47pF ±10%
C213	1	1	1	EA33502590	Elect 3.3µF ±10% 25V
C214	1	1	1	EA47601090	Elect 47µF 10V
C215	1	1	1	DF55151510	Film 150pF ±5%
C216	1	1	1	EA10601690	Elect 10µF 16V
C217	1	1	1	EA47503590	Elect 4.7µF 35V
C218	1	1	1	DF16272300	Film 0.0027µF ±10%
C219	1	1	1	EA22505090	Elect 2.2µF 50V
C221	1	1	1	DF15104300	Film 0.1µF ±5%
C222	1	1	1	EA10601690	Elect 10µF 16V
C223	1	1	1	EM33402510	Elect 0.33µF 25V
C224	1	1	1	DF15472300	Film 0.0047µF ±5%
C225	1	1	1	EA10601690	Elect 10µF 16V
C226	1	1	1	DF15153300	Film 0.015µF ±5%
C227	1	1	1	DF15153300	Film 0.015µF ±5%
C228	1	1	1	EA10601690	Elect 10µF 16V
C229	1	1	1	DF16183300	Film 0.018µF ±10%
C230	1	1	1	DF16223300	Film 0.022µF ±10%
C231	1	1	1	DF16683300	Film 0.068µF ±10%
C232	1	1	1	EM22402510	Elect 0.22µF 25V
C233	1	1	1	EA47503590	Elect 4.7µF 35V
C234	1	1	1	EA10601690	Elect 10µF 16V
C235	1	1	1	DF16152300	Film 0.0015µF ±10%
C236	1	1	1	DF55151510	Film 150pF ±5%
C237	1	1	1	DF16333300	Film 0.033µF ±10%
C238	1	1	1	EA47503590	Elect 4.7µF 35V
C239	1	1	1	EA22601090	Elect 22µF 10V
C240	1	1	1	DD15201360	Ceramic 200pF ±5%
C241	1	1	1	DF16103300	Film 0.01µF ±10%
C242	1	1	1	EA47601090	Elect 47µF 10V
C243	1	1	1	EA47701090	Elect 470µF 10V
C244	1	1	1	EA47700690	Elect 470µF 6.3V
C245	1	1	1	EA47700690	Elect 470µF 6.3V
C246	1	1	1	DF16473300	Film 0.047µF ±10%
C247	1	1	1	EA47601090	Elect 47µF 10V
C248	1	1	1	DF16103300	Film 0.01µF ±10%
C249	1	1	1	EA47700690	Elect 470µF 6V
C250	1	1	1	DD15201360	Ceramic 200pF ±5%
C251	1	1	1	EA47700690	Elect 470µF 6V
C252	1	1	1	EA22601090	Elect 22µF 10V
C253	1	1	1	DF55221510	Film 220pF ±5%
C254	1	1	1	EA47601090	Elect 47µF 10V
C255	1	1	1	EA10701690	Elect 100µF 16V
C256	1	1	1	EA47503590	Elect 4.7µF 35V

- ●(U) for U.S.A.
- ●(C) for Canada
- ●(N) for Europe

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
C257	1	1	1	DF16332300	Film 0.0033μF ±10%
C258	1	1	1	DD15201360	Ceramic 200pF ±5%
C301	1	1	1	EA22700690	Elect 220μF 6V
C302	1	1	1	EA22601090	Elect 22μF 10V
C303	1	1	1	EA10601690	Elect 10μF 16V
C304	1	1	1	EA10701690	Elect 100μF 16V
C305	1	1	1	EA22701690	Elect 220μF 16V
C306	1	1	1	EA22701690	Elect 220μF 16V
C307	1	1	1	EA22702590	Elect 220μF 25V
C308	1	1	1	EA10505090	Elect 1μF 50V
C309	1	1	1	DF16223300	Film 0.022μF ±10%
C310	1	1	1	EA10701090	Elect 100μF 10V
C311	1	1	1	EA22801020	Elect 2200μF 10V
C312	1	1	1	EA22801020	Elect 2200μF 10V
C313	1	1	1	EA22701090	Elect 220μF 10V
C314	1	1	1	EA47701090	Elect 470μF 10V
C315	1	1	1	DF16153300	Film 0.015μF ±10%
C316	1	1	1	DF16153300	Film 0.015μF ±10%
C317	1	1	1	DF16682300	Film 0.0068μF ±10%
C318	1	1	1	EZ22701010	Elect 220μF 10V
C319	1	1	1	DF16103520	Film 0.01μF 100V
C320	1	1	1	EA47601090	Elect 47μF 10V
C321	1	1	1	EA10701090	Elect 100μF 10V
					P100-RESISTORS
					(All Resistors are ±5% and ¼W)
R102	1	1	1	GD05123140	12KΩ
R103	1	1	1	GD05100140	10Ω
R104	1	1	1	RN05154140	150KΩ
R105	1	1	1	RN05473140	47KΩ
R106	1	1	1	GD05223140	22KΩ
R107	1	1	1	GD05103140	10KΩ
R108	1	1	1	GD05151140	150Ω
R109	1	1	1	GD05333140	33KΩ
R110	1	1	1	GD05272140	2.7KΩ
R111	1	1	1	GD05101140	100Ω
R112	1	1	1	GD05103140	10KΩ
R113	1	1	1	RN05184140	180KΩ
R114	1	1	1	GD05332140	3.3KΩ
R115	1	1	1	RA03020030	Trimming 3KΩ (B)
R116	1	1	1	GD05222140	2.2KΩ
R117	1	1	1	GD05682140	6.8KΩ
R118	1	1	1	RA02030060	Trimming 20KΩ (B)
R119	1	1	1	RK02030490	Variable 20KΩ (A)
R120	1	1	1	GD05153140	15KΩ
R121	1	1	1	GD05681140	680Ω
R122	1	1	1	GD05103140	10KΩ
R123	1	1	1	GD05102140	1KΩ
R124	1	1	1	GD05223140	22KΩ
R125	1	1	1	GD05103140	10KΩ
R126	1	1	1	GD05104140	100KΩ
R127	1	1	1	GD05102140	1KΩ
R128	1	1	1	GD05562140	5.6KΩ
R129	1	1	1	GD05100140	10Ω
R130	1	1	1	GD05821140	820Ω
R131	1	1	1	GD05101140	100Ω

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
R132	1	1	1	GD05105140	1MΩ
R133	1	1	1	GD05332140	3.3KΩ
R134	1	1	1	GD05102140	1KΩ
R135	1	1	1	GD05152140	1.5KΩ
R136	1	1	1	RA02020180	Trimming 20KΩ (B)
R137	1	1	1	GD05821140	820Ω
R138	1	1	1	GD05102140	1KΩ
R139	1	1	1	GD05473140	47KΩ
R141	1	1	1	GD05181140	180Ω
R142	1	1	1	GF05331140	330Ω
R143	1	1	1	GD05392140	3.9KΩ
R144	1	1	1	GD05473140	47KΩ
R145	1	1	1	GD05122140	1.2KΩ
R146	1	1	1	RA02030060	Trimming 20KΩ (B)
R147	1	1	1	GD05822140	8.2KΩ
R148	1	1	1	GD05822140	8.2KΩ
R149	1	1	1	GD05390140	39Ω
R150	1	1	1	GD05220140	220Ω
R151	1	1	1	GD05102140	1KΩ
R152	1	1	1	GD05473140	47KΩ
R153	1	1	1	GD05274140	270KΩ
R154	1	1	1	GD05102140	1KΩ
R155	1	1	1	GD05472140	4.7KΩ
R156	1	1	1	GD05123140	12KΩ
R157	1	1	1	RK02030502	Variable 20KΩ (A)
R158	1	1	1	RK02030502	Variable 20KΩ (A)
R159	1	1	1	GD05102140	1KΩ
R160	1	1	1	GD05302140	3KΩ
R161	1	1	1	GD05333140	33KΩ
R162	1	1	1	RC10022120	2.2Ω ±10% ½W
R163	1	1	1	GD05333140	33KΩ
R164	1	1	1	GD05333140	33KΩ
R165	1	1	1	GD05302140	3KΩ
R166	1	1	1	RA04730060	Trimming 47KΩ (B)
R167	1	1	1	GD05333140	33KΩ
R168	1	1	1	GD05392140	3.9KΩ
R170	1	1	1	GD05102140	1KΩ
R202	1	1	1	GD05123140	12KΩ
R203	1	1	1	GD05100140	10Ω
R204	1	1	1	RN05154140	150KΩ
R205	1	1	1	RN05473140	47KΩ
R206	1	1	1	GD05223140	22KΩ
R207	1	1	1	GD05103140	10KΩ
R208	1	1	1	GD05151140	150Ω
R209	1	1	1	GD05333140	33KΩ
R210	1	1	1	GD05272140	2.7KΩ
R211	1	1	1	GD05101140	100Ω
R212	1	1	1	GD05103140	10KΩ
R213	1	1	1	RN05184140	180KΩ
R214	1	1	1	GD05332140	3.3KΩ
R215	1	1	1	RA03020030	Trimming 3KΩ (B)
R216	1	1	1	GD05222140	2.2KΩ
R217	1	1	1	GD05682140	6.8KΩ
R218	1	1	1	RA02030060	Trimming 20KΩ (B)
R219	1	1	1	RK02030490	Variable 20KΩ (A)

- ●(U) for U.S.A.
- ●(C) for Canada
- ●(N) for Europe

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
R220	1	1	1	GD05153140	15KΩ
R221	1	1	1	GD05681140	680Ω
R222	1	1	1	GD05103140	10KΩ
R223	1	1	1	GD05102140	1KΩ
R224	1	1	1	GD05223140	22KΩ
R225	1	1	1	GD05103140	10KΩ
R226	1	1	1	GD05104140	100KΩ
R227	1	1	1	GD05102140	1KΩ
R228	1	1	1	GD05562140	5.6KΩ
R229	1	1	1	GD05100140	10Ω
R230	1	1	1	GD05821140	820Ω
R231	1	1	1	GD05101140	100Ω
R232	1	1	1	GD05105140	1MΩ
R233	1	1	1	GD05332140	3.3KΩ
R234	1	1	1	GD05102140	1KΩ
R235	1	1	1	GD05152140	1.5KΩ
R236	1	1	1	RA02020180	Trimming, 2KΩ (B)
R237	1	1	1	GD05821140	820Ω
R238	1	1	1	GD05102140	1KΩ
R239	1	1	1	GD05473140	47KΩ
R241	1	1	1	GD05181140	180Ω
R243	1	1	1	GD05392140	3.9KΩ
R244	1	1	1	GD05473140	47KΩ
R245	1	1	1	GD05122140	1.2KΩ
R246	1	1	1	RA02030060	Trimming, 20KΩ (B)
R247	1	1	1	GD05822140	8.2KΩ
R248	1	1	1	GD05822140	8.2KΩ
R249	1	1	1	GD05390140	39Ω
R250	1	1	1	GD05220140	22Ω
R251	1	1	1	GD05102140	1KΩ
R252	1	1	1	GD05473140	47KΩ
R253	1	1	1	GD05274140	270KΩ
R254	1	1	1	GD05102140	1KΩ
R255	1	1	1	GD05472140	4.7KΩ
R256	1	1	1	GD05123140	12KΩ
R257	1	1	1	RK02030502	Variable, 20KΩ (A)
R258	1	1	1	RK02030502	Variable, 50KΩ (A)
R259	1	1	1	GD05102140	1KΩ
R260	1	1	1	GD05302140	3KΩ
R261	1	1	1	GD05333140	33KΩ
R262	1	1	1	RC10022120	2.2Ω ±10% ½W
R263	1	1	1	GD05333140	33KΩ
R264	1	1	1	GD05333140	33KΩ
R265	1	1	1	GD05302140	3KΩ
R266	1	1	1	RA04730060	Trimming, 47KΩ (B)
R267	1	1	1	GD05333140	33KΩ
R268	1	1	1	GD05392140	3.9KΩ
R270	1	1	1	GD05102140	1KΩ
R301	1	1	1	RA01030260	Trimming, 10KΩ (B)
R302	1	1	1	GD05223140	22KΩ
R303	1	1	1	GD05105140	1MΩ
R304	1	1	1	GD05223140	22KΩ
R305	1	1	1	RA02030060	Trimming, 20KΩ (B)
R306	1	1	1	GF05220120	22Ω ½W
R307	1	1	1	GF05047120	4.7Ω ½W

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
R308	1	1	1	GD05561140	560Ω
R309	1	1	1	GD05681140	680Ω
R310	1	1	1	GD05330140	33Ω
R311	1	1	1	GF05010120	1Ω ½W
R312	1	1	1	GD05010140	1Ω
R313	1	1	1	GF05220120	22Ω ½W
R314	1	1	1	GD05022140	22Ω
R315	1	1	1	GD05151140	150Ω
R316	1	1	1	RA02030060	Trimming, 20KΩ (B)
					P100-SEMICONDUCTORS
Q101	1	1	1	HT107861Q0	Transistor 2SA786LN(Q)
Q102	1	1	1	HT320211Q0	Transistor 2SC2021LN(Q)
Q103	1	1	1	HT320211Q0	Transistor 2SC2021LN(Q)
Q104	1	1	1	HT320211Q0	Transistor 2SC2021LN(Q)
Q105	1	1	1	HT320601R0	Transistor 2SC2060R
Q106	1	1	1	HT317411Q0	Transistor 2SC1741(Q)
Q107	1	1	1	HC10039050	IC TA7207P
Q108	1	1	1	HC10039050	IC TA7207P
Q109	1	1	1	HC10026010	IC HA11226
Q111	1	1	1	HD20005210	Diode 1SR34
Q112	1	1	1	HD20011050	Diode 1S1555
Q113	1	1	1	HD20011050	Diode 1S1555
Q114	1	1	1	HD10001010	Diode 1N34A
Q115	1	1	1	HD10001010	Diode 1N34A
Q116	1	1	1	HD10001010	Diode 1N34A
Q117	1	1	1	HC20001400	IC HINET 216
Q201	1	1	1	HT107861Q0	Transistor 2SA786LN(Q)
Q202	1	1	1	HT320211Q0	Transistor 2SC2021LN(Q)
Q203	1	1	1	HT320211Q0	Transistor 2SC2021LN(Q)
Q204	1	1	1	HT320211Q0	Transistor 2SC2021LN(Q)
Q205	1	1	1	HT320601R0	Transistor 2SC2060R
Q206	1	1	1	HT317411Q0	Transistor 2SC1741(Q)
Q207	1	1	1	HC10039050	IC TA7207P
Q208	1	1	1	HC10039050	IC TA7207P
Q211	1	1	1	HD20005210	Diode 1SR34
Q212	1	1	1	HD20011050	Diode 1S1555
Q213	1	1	1	HD20011050	Diode 1S1555
Q214	1	1	1	HD10001010	Diode 1N34A
Q215	1	1	1	HD10001010	Diode 1N34A
Q216	1	1	1	HD10001010	Diode 1N34A
Q217	1	1	1	HC20001400	IC HINET 216
Q301	1	1	1	HT320601Q0	Transistor 2SC2060(Q)
Q302	1	1	1	HT320212A0	Transistor 2SC2021LN(Q or R
Q303	1	1	1	HT322702A0	Transistor 2SC2270(A or B)
Q304	1	1	1	HT320601Q0	Transistor 2SC2060(Q)
Q305	1	1	1	HT322702A0	Transistor 2SC2270(A or B)
Q306	1	1	1	HD20005210	Diode 1SR34
Q307	1	1	1	HD20011050	Diode 1S1555
Q308	1	1	1	HD30025090	Zener WZ-150
Q309	1	1	1	HD30010060	Zener RD-4.7V
Q310	1	1	1	HD20020080	Diode MI-15(R)
Q311	1	1	1	HD20019080	Diode MI-15
Q312	1	1	1	HD20005210	Diode 1SR34
Q313	1	1	1	HD20011050	Diode 1S1555
Q314	1	1	1	HD20005210	Diode 1SR34

- (U) for U.S.A.
- (C) for Canada
- (N) for Europe

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
					P100-MISCELLANEOUS
J101	1	1	1	YJ01001150	Jack, Mic
J201	1	1	1	YJ01001150	Jack, Mic
J301	1	1	1	YP10002130	Plug (6P)
J303	1	1	1	YP10001920	Plug (3P)
L101	1	1	1	LC22260070	Choke Coil 22mH
L102	1	1	1	LC24750040	Choke Coil 4.7mH
L103	1	1	1	LC22260070	Choke Coil 22mH
L201	1	1	1	LC22260070	Choke Coil 22mH
L202	1	1	1	LC24750040	Choke Coil 4.7mH
L203	1	1	1	LC22260070	Choke Coil 22mH
L301	1	1	1	LC24730010	Choke Coil 47μH
L302	1	1	1	LC24730010	Choke Coil 47μH
L303	1	1	1	LC24730010	Choke Coil 47μH
S101	1	1	1	SS09020100	Slide Switch, Rec/Play
S201	1	1	1	SS09020100	Slide Switch, Rec/Play
S301	1	1	1	SC06030060	Switch, Rec Select
S302	1	1	1	SC02020270	Switch, Dolby
S303	1	1	1	SC06020012	Switch, Bias
S304	1	1	1	SC08020010	Switch, EQ
T301	1	1	1	TC10130020	OSC Transformer
T302	1	1	1	TC10190040	OSC Transformer
					P400-POWER SUPPLY CIRCUIT BOARD
P400			1	YK42261720	P.W. Board, Power Supply
			1	ZZ42268720	P.W. Board Assembly
F401			1	FS10125800	Fuse 1.25AT 250V
J401 ~ J406			6	YP10001530	Plug
J407			1	YJ08000280	Jack, Fuse Socket
J408			1	YJ08000280	Jack, Fuse Socket
					P500-JACK CIRCUIT BOARD
P500	1	1	1	YK42261730	P.W. Board, Jack
	1	1		ZZ42261730	P.W. Board Assembly
			1	ZZ42268730	P.W. Board Assembly
					P500-CAPACITORS
C501	1	1	1	EA22700690	Elect 220μF 6V
C502	1	1	1	DK18103300	Ceramic 0.01μF +100% −0
					P500-RESISTORS (All Resistors are ±5% and ¼W)
R501	1	1	1	GD05333140	33KΩ
R502	1	1	1	GD05333140	33KΩ
R503	1	1	1	GD05102140	1KΩ
R504	1	1	1	GD05102140	1KΩ
R505	1	1	1	GD05223140	22KΩ

REF. DESIG.	Q'TY			PART NO.	DESCRIPTION
	U	C	N		
R506	1	1	1	GD05223140	22KΩ
R507			1	GD05273140	27KΩ
R508			1	GD05273140	27KΩ
R511	1	1	1	GD05102140	1KΩ
R512	1	1	1	GD05472140	4.7KΩ
R513	1	1	1	GD05103140	10KΩ
R514	1	1	1	GD05822140	8.2KΩ
R515	1	1	1	GD05222140	2.2KΩ
R516	1	1	1	GD05471140	470Ω
R517	1	1	1	GD05471140	470Ω
R518	1	1	1	GD05562140	5.6KΩ
R519	1	1	1	GD05101140	100Ω
J501	1	1		BY01070030	Jack Board
J501			1	BY01080010	Jack Board
					P600-HEADPHONE CIRCUIT BOARD
P600	1	1	1	YK42261740	P.W. Board, Headphone
	1	1	1	ZZ42261740	P.W. Board Assembly
R601	1	1	1	GD05151140	Resistor 150Ω ±5% ¼W
R602	1	1	1	GD05151140	Resistor 150Ω ±5% ¼W
J601	1	1	1	YJ01001120	Jack, Headphone
					P700-MIC ATT. CIRCUIT BOARD
P700	1	1	1	YK42261750	P.W. Board, Mic Att.
	1	1	1	ZZ42261750	P.W. Board Assembly
R701	1	1	1	GD05104140	Resistor 100KΩ ±5% ¼W
R702	1	1	1	GD05104140	Resistor 100KΩ ±5% ¼W
S701	1	1	1	SP02020360	Push Switch, Mic Att.
					P800-RECHARGEABLE CIRCUIT BOARD
P800	1	1	1	YK42261760	P.W. Board, Rechargeably
	1	1	1	ZZ42261760	P.W. Board Assembly
R801	1	1	1	RC10220120	Resistor 22Ω ±10% ½W
					P900-FUSE CIRCUIT BOARD
P900	1	1		YK42261770	P.W. Board, Fuse
	1	1		ZZ42261770	P.W. Board Assembly
F901	1	1		FS20250910	Fuse 2.5A 250V

(W01-99)	Assembly and Wiring
(T01-99)	Adjustment
(X01-00)	Correction

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1-213-998-9333

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2. Complete part numbers.
3. Complete description of parts.
4. Model number for which part is required (indicate SUPERSCOPE).
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